

March 3, 1964

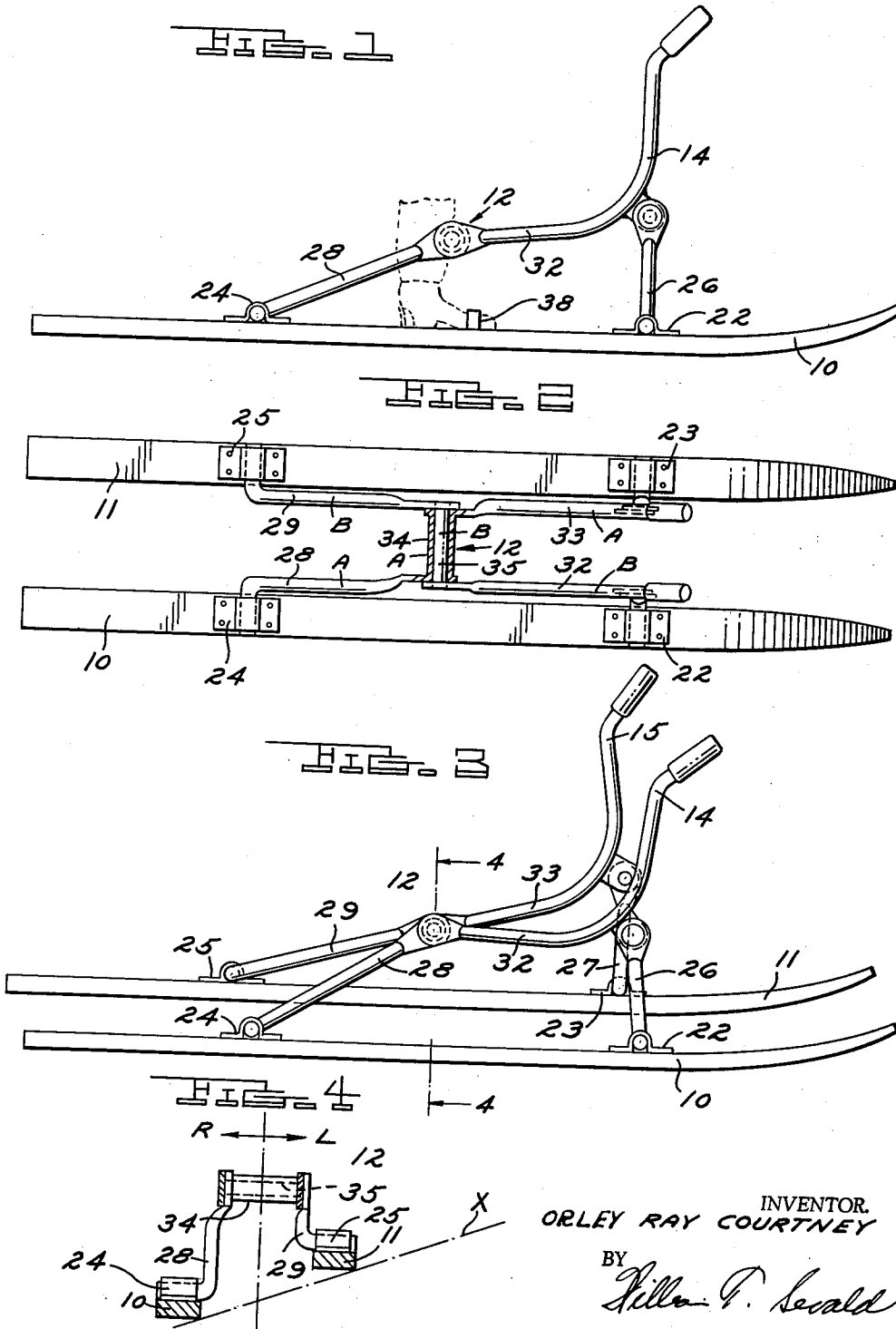
O. R. COURTNEY

3,123,375

ARTICULATED SKI SLED DEVICE

Filed June 15, 1962

2 Sheets-Sheet 1



INVENTOR.
ORLEY RAY COURTNEY

BY

William P. Sevald
ATTORNEY

March 3, 1964

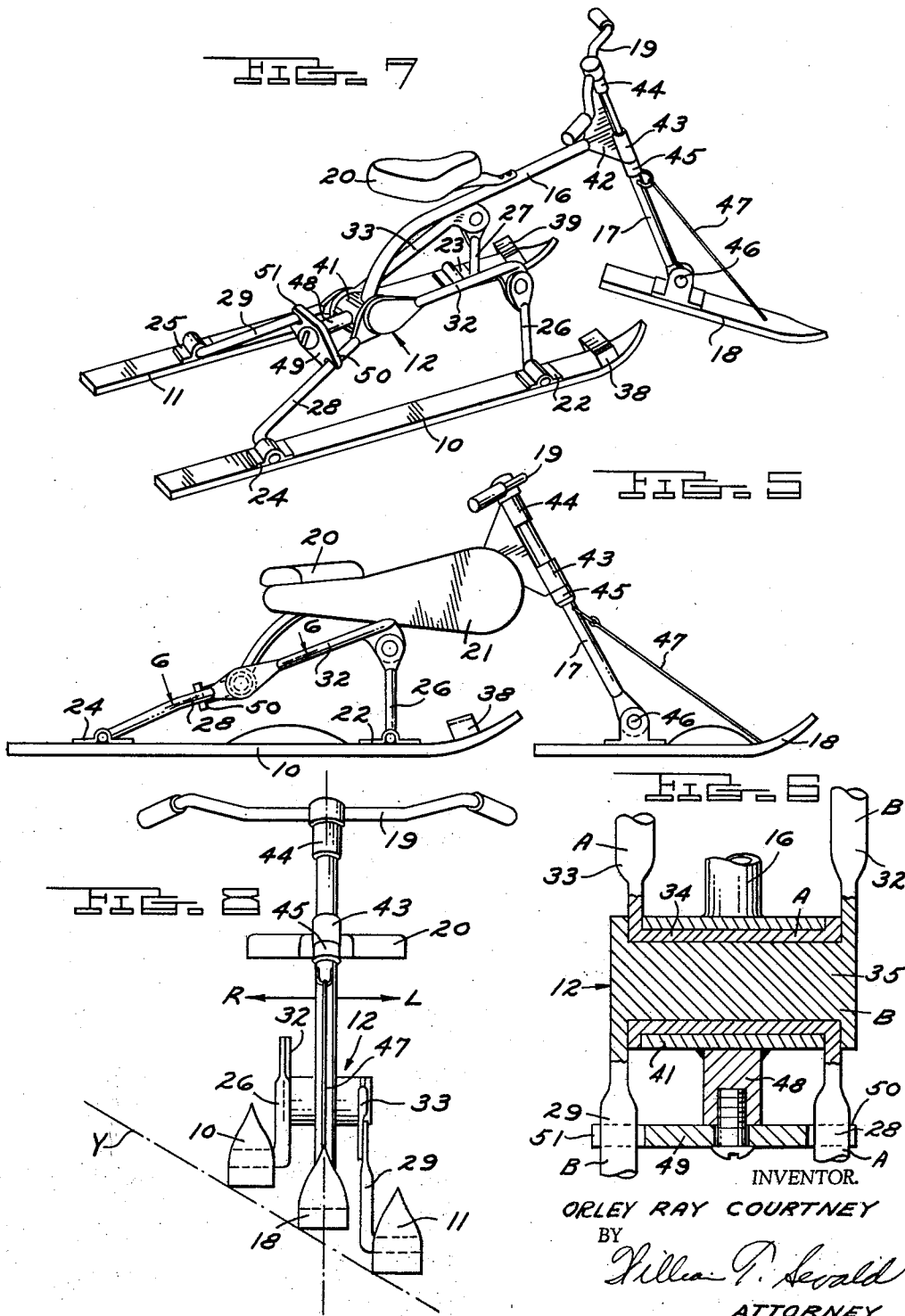
O. R. COURTNEY

3,123,375

ARTICULATED SKI SLED DEVICE

Filed June 15, 1962

2 Sheets-Sheet 2



1

3,123,375

ARTICULATED SKI SLED DEVICE
Orley Ray Courtney, 1353 Highwood Blvd.,
Pontiac, Mich.

Filed June 15, 1962, Ser. No. 202,822
9 Claims. (Cl. 280-16)

This invention relates to snow and water skiing devices having paired skis interconnected by articulated linkage operable to locate the skis in desired selected positions at desired selected angles relative to snow or water for controlling direction, turning, and traversing.

Sliding vehicles such as sleds have embodied runners interconnected by means to effect turning relative to a surface. However, the several devices of the prior art have not proven entirely satisfactory in that they do not have suitable means for moving the runners relative to each other, relative to the rider, and relative to the skiing surface to give the rider control. Conversely, with unconnected skis, the problem with a separate ski on each foot is to keep the skis coordinated and/or parallel to each other.

The device of the invention embodies paired parallel skis interconnected by articulating linkage coordinating the skis for relative up and down vertical motion relative to one another. The linkage also provides equal sidewise angulation or tilting of the skis. The skis may move up and down relative to one another and also tilt from side to side at the same time so that the rider may operate the skis against the skiing surface or medium to exercise control such as in conventional snow or water skiing.

The structure, operation, and linkage of the devices of the invention may be better understood by reference to conventional controlled snow and water skiing. In this type of skiing, a skier has a ski fixed on each foot and slides down and across the slope of a hill or behind a tow boat and makes reverse turns at the side edges of the slope or as limited by the tow rope angle.

In traversing across the face of a slope on snow, the uphill ski lies in an upper horizontal plane and the downhill ski lies in a lower horizontal plane. The skier's body is sidewise vertical although he may incline slightly forwardly. The skis are held thus so that their uphill edges bite into the sloping surface of the hill and prevent the skis from sliding sidewise down the hill. This permits the skier to traverse across the slope of a hill at a slight downward slope compared to the full slope of the hill.

Upon completing a traverse across the face of a slope, the snow skier must make a U-turn and then traverse back across the slope in a reverse direction. In the reverse traverse, the former downhill ski is now the uphill ski and the former uphill ski is now the downhill ski. In other words, the positions of the skis reverse. Again the body is positioned sidewise vertical and the skis are held in a substantially horizontal plane normal to the body with their uphill edges biting into the snow on the hill slope preventing sidewise downhill sliding.

In a traverse, when the skier approaches the side of the slope in snow skiing he must make a U-turn to traverse back across the slope. He accomplishes this by turning his skis gradually downhill until they lie along the slope of the hill pointing directly downwardly midway in the U-turn. This involves some plowing action against the centrifugal force involved in the turn.

The snow skier comes out of the midway portion of the U-turn by turning his skis from the downhill position gradually back across the hill. This also involves some plowing action. Upon coming out of the turn, the plowing action terminates and the skis arrive at the reverse traversing angle with the uphill edges biting in and preventing sidewise downhill sliding.

Weight distribution of the skier is an important element.

2

In traversing across the slope, the skier stands sidewise vertical and places his weight on the uphill ski. When he wishes to turn, he places most of his weight on the downhill ski and leans downhill from the vertical causing the skis to slide sidewise slightly down the hill to get into the turn. In conjunction with shifting his weight between the skis, the skier also moves his body to an angle to compensate gravitational forces with acceleration forces throughout the turn. This is similar to riding a bicycle across the face of a hill and making a U-turn on the bicycle on the slope with the turn made downhill.

In water skiing the technique is similar relative to centrifugal force. It is different relative to gravitational force as the water skier is on a flat plane and need not lean forward to compensate for the slope angle of the hill. In water skiing with the rider holding the tow rope in hand, he must lean backward to compensate for the drag of the skis.

The water skier therefore leans somewhat backward but he must bank his turns against centrifugal force and/or against the pull of the tow line. In traversing back and forth behind a tow boat, the water skier's action and technique relative to the water is therefore similar to a snow skier's action and technique relative to snow. In water skiing, weight distribution is also an important factor in making turns and in traversing.

With the foregoing in view, it will be understood that the skis, articulated linkage, and control means of the invention so coordinate the skis that the skis are automatically positioned relative to one another by the body angulation and weight distribution of the skier. The linkage keeps the skis coordinated relative to one another, to the skier, and to the slope or water.

It is therefore a primary object of the invention to provide a ski device for controlled sliding on snow or water which will permit a skier to accomplish traversing and turning by shifting his weight and angling his body.

An object of the invention is to provide paired skis and articulated linkage which holds the skis substantially parallel while permitting them to lie not only in the same horizontal plane but also to lie parallel in different horizontal planes, and also to lie sidewise at an angle relative to the skiing surface and force direction as desired.

An object of the invention is to provide legs pivotally connected to paired skis which allows forward and rearward pivoting of the legs relative to the skis to let the skis raise and lower relative to one another but which prevents sidewise relative pivoting motion between the legs and the skis.

An object of the invention is to provide pivotally mounted legs on the skis which do not pivot sidewise relative to the skis so that sidewise angular movement of the legs moves the skis sidewise angularly thereby allowing a skier to control the sidewise angulation of the skis relative to a skiing surface.

An object of the invention is to provide linkage so articulated that it raises and lowers each ski relative to the other while keeping the skis parallel at all times.

An object of the invention is to provide linkage so articulated that it raises and lowers the front and rear of each ski equally relative to itself and also relative to the front and back of the other ski.

An object of the invention is to provide linkage so articulated that it raises and lowers the skis relative to one another reciprocally so that each ski moves in a direction opposite to the other.

An object of the invention is to provide leg linkage crossing over from the front of one ski to the rear of the other ski and leg linkage crossing over from the front of the other ski to the rear of the one ski.

An object of the invention is to provide crossed over beam portions in the leg linkage pivotally interconnected

intermediate the ends of the beam portions effecting a scissoring action between the beam portions wherein the front end and rear end of each beam moves in opposite directions in scissoring action.

An object of the invention is to provide scissoring beam portions wherein the front end of one beam and the rear end of the other beam move in the same direction the same distance at the same time and wherein the rear end of the one beam and the front end of the other beam move in the opposite direction the same distance at the same time.

An object of the invention is to provide scissoring cross-connected beam portions so that the front end of one beam portion and the rear end of the other beam portion are respectively connected to the front end and rear end of one ski.

An object of the invention is to provide linkage wherein the opposite ends of opposite beam portions are cross-connected to each ski with the beam portions pivotally interconnected for scissoring action so that each ski moves up and down with the front of one beam portion and the rear of the other beam portion.

An object of the invention is to provide front legs having bottom ends pivotally mounted on the skis and having upper ends pivotally connected to opposite beam portions in a knee joint.

An object of the invention is to provide cross-connected scissoring beam portions between the front of one ski and the rear of the other ski so that each ski rises and lowers in the scissoring action with the front of one beam portion and the rear of the other beam portion with the skis moving in opposite directions relative to one another.

An object of the invention is to provide control means associated with the articulated linkage for controlling the sidewise angulation of the linkage and skis relative to the skiing surface.

An object of the invention is to provide control means for controlling the scissoring action of the articulated linkage.

An object of the invention is to provide hand levers for controlling the sidewise angulation and the scissoring action of the articulated linkage.

An object of the invention is to provide a bar leading forwardly from the pivotal interconnection between the beam portions for pivotally supporting a front ski portion, a flotation tank, and a seat.

An object of the invention is to provide a pivotal mounting on the bar forward end supporting the front ski controlled by handlebars so that the skier may use the front ski to effect snow or water plowing action.

An object of the invention is to provide loops or other bindings on the skis for holding the rider's feet.

These and other objects of the invention will become apparent by reference to the following description of devices embodying the invention taken in connection with the accompanying drawings in which:

FIG. 1 is a side elevational view of the device seen in FIG. 2 showing the skis in the same horizontal plane.

FIG. 2 is a top plan view of the device seen in FIG. 1, showing the pivot point in cross-section.

FIG. 3 is a view similar to FIG. 1 showing the skis lying in different horizontal planes.

FIG. 4 is a cross-sectional view of FIG. 3 taken on the line 4—4 thereof showing the skis in different horizontal planes indicating a hill slope or water surface by a broken line.

FIG. 5 is a side elevational view of a ski device embodying the invention having a front steering ski and a flotation tank for water skiing.

FIG. 6 is a partial enlarged cross-sectional view of FIG. 5 taken on the line 6—6 thereof showing the means effecting pivotal cross-connection in greater detail.

FIG. 7 is a perspective view of the device seen in FIG. 5, less the flotation tank, showing the skis in different

horizontal planes and with the front steering ski angulated in a snow or water plowing position; and

FIG. 8 is a front elevational view of the device seen in FIG. 7 with the skis disposed in different horizontal planes engaging the slope of a hill or the surface of water indicated by a broken line.

Referring now to the drawings wherein like numerals refer to like and corresponding parts throughout the several views, one preferred device disclosed therein to illustrate the invention comprises paired skis 10 and 11 connected at pivot points to articulated linkage 12 which is cross-connected between the skis 10 and 11 in a scissoring action. Hand levers 14 and 15 operate and/or assist in operating the articulated linkage 12 to move the skis in up and down movement oppositely to each other and to control sidewise angulation of the skis.

In another preferred device, a bar 16 extends forwardly from the articulated linkage 12 to a steering rod 17 pivotally connected to a front ski 18 and operated by handlebars 19. A seat 20 may be supported on the bar 16. A flotation tank 21 may be connected to the bar 16.

A skier may stand midway on the skis as indicated by dotted lines in FIG. 1 and operate the hand levers 14 and 15 to control the articulated linkage 12 and to control the side-to-side tilt of the skis.

A skier may sit on the seat 20, FIG. 7, and place his feet on the front of the skis and control the sidewise movement of the skis by the handlebars 19, seat 20, and/or bar 16 and also control the steering snow plowing action of the front ski 18 by turning the handlebars.

The superstructure on the skis may be considered a frame.

More particularly, the skis 10 and 11 have front bearings 22 and 23 respectively and rear bearings 24 and 25 respectively. Front legs 26 and 27 are equipped with feet respectively pivoted in the bearings 22 and 23. Rear legs 28 and 29 have feet respectively pivoted in the bearings 24 and 25. It is to be noted that the legs may pivot forwardly and rearwardly relative to the bearings and skis and that they may not pivot sidewise relative to the bearings or the skis. This results in any sidewise angular movement of the legs causing like sidewise angular movement in the skis.

Intermediate legs 32 and 33 are respectively pivotally connected to the front legs 26 and 27. The pivotal connection between the intermediate legs 32 and 33 and the front legs 26 and 27 allows forward and rearward pivotal movement but prohibits side-to-side pivotal movement.

The rear legs 28 and 29 extend forwardly towards the intermediate legs 32 and 33. The intermediate legs 32 and 33 extend rearwardly towards the rear legs 28 and 29.

A transverse sleeve 34 is welded to the rear end of the intermediate leg 33 and to the front end of the rear leg 28. This connects the front end of the ski 11 with the back end of the ski 10.

The rear end of the intermediate leg 32 is welded to a transverse pin 35 pivoted in the sleeve 34. The pin 35 is also welded to the front end of the rear leg 29. This connects the front end of the ski 10 with the rear end of the ski 11.

The sleeve 34 and the pin 35 pivot relative to one another. The rear leg 28, sleeve 34, and intermediate leg 33 may be considered a beam portion "A" as they are fixedly interconnected. The rear leg 29, pin 35 and intermediate leg 32 may be considered a beam portion "B" as they are fixedly interconnected. Beam portions A and B are pivotally interconnected by the co-axial sleeve 34 and pin 35 in a scissoring action.

In a scissoring action the opposite ends of the same beam move in opposite direction. In a scissoring action the opposite ends of opposite beams move in the same direction.

As ski 11 is connected to the opposite ends of opposite beams A and B, it moves up and down with these opposite ends of opposite beams. As ski 10 is connected to the

other opposite ends of opposite beams A and B, it moves up and down with these other opposite ends of the opposite beams. Thus, when ski 11 rises, ski 10 lowers. Thus, when ski 10 rises, ski 11 lowers.

It may be considered that the sleeve 34 and pin 35 are mounted midway between the beams and that their pivotal interconnection remains relatively fixed as a stationary pivot point about which the movement of the articulated linkage and skis occurs.

Considering the pivotal interconnection of the sleeve 34 and pin 35 as a base point for scissoring action of the beam portions A and B, it will be understood that the opposite ends of opposite beams namely intermediate leg 33 of beam A and rear leg 29 of beam B connected to ski 11 will rise and lower together but oppositely relative to the intermediate leg 32 of beam B and the rear leg 23 of beam A connected to ski 10. The raising and lowering of the skis 10 and 11 are therefore opposite to each other in direction and distance.

The portions of the device so far described are common to the device disclosed in FIGS. 1-4 and to the device disclosed in FIGS. 5-8.

The skier toe loops 38 and 39 may be positioned at the front of the skis 10 and 11 as seen in FIG. 7 or midway on the skis 10 and 11 as seen in FIG. 1. The hand levers 14 and 15 may be formed as integral extensions of the intermediate legs 32 and 33 respectively as shown or separately connected as designed. The skis may be hollow pontoons to provide flotation in water skiing during standing periods such as prior to and after a tow.

Referring to FIGS. 5-8, a drum 41 surrounds the sleeve 34 and is welded to the bar 16. A stub shaft 48 extends from the drum 41 and pivotally supports a cross-head 49 having a yoke 50 engaging a portion of one beam such as the rear leg 29 and a yoke 51 engaging a portion of the other beam such as the rear leg 23. As the legs swing up and down the yokes 50 and 51 pivot the crosshead 49. The crosshead 49 and stub shaft 48 prevent free rotation of the drum 41. This prevents the drum 41 and bar 16 from swinging up or down relative to the skis 10 and 11.

A web 42 may be welded to the front end of the bar 16 and supports sleeves 43 and 44 which pivotally house a steering rod 17.

A boss 45 fixed on the steering rod 17 may abut the sleeve 43 thereby supporting the front end of the bar 16 on the steering rod 17 and front ski 18. The front ski 18 may be pivotally connected to the steering rod 17 as by a pivotal connection 46. The pivotal connection 46 allows front and back pivoting of the ski 18 relative to the rod 17 but prohibits side-to-side relative pivoting between the rod 17 and front ski 18. The rod 17 and front ski 17 angulate sidewise together.

A spring or tie 47 may be disposed between the rod 17 and the front end of the front ski 18 to prevent the front ski 18 dropping at its front end when out of contact with an otherwise supporting surface.

As the crosshead 49, stub shaft 48, drum 41, and bar 16 cannot pivot up or down relative to the skis 10 and 11, the front ski 18, rod 17, handlebars 19, web 42, and bar 16 also cannot move up and down relative to the skis 10 and 11 as the bar 16 is welded to the drum 41.

The front ski 18, FIG. 8, is in a central longitudinal position between the right ski 10 and the left ski 11. The front ski 18 normally occupies a horizontal plane in which both right and left skis 10 and 11 may lie such as on a flat surface. It will also be noted when inclined sidewise such as to a slope or banked on water that the uphill or inside side edges of all the skis bite into the slope of the hill or the surface of water as indicated by the broken line "Y" thereby preventing downhill sidewise sliding or water side-slipping of the skis.

The operation of the device of the invention may be explained as analogous to the operation of a bicycle. When riding a bicycle in a straight line, the rider holds the frame and his body in a vertical plane. When the

rider turns the bicycle to the right he inclines the frame and his body to the right. When the rider turns the bicycle to the left he inclines the frame and his body to the left. If the rider rides a bicycle across the slope of a hill, he still holds the frame and his body in a vertical plane so that the hill slants at a horizontal angle beneath the frame and the rider.

Thus, in snow skiing on the device of the invention, the skier rides across the slope of a hill (called a traverse) holding his body and the frame in a substantially vertical position as seen in FIG. 8. The cross-connected articulated linkage 12 allows the left ski 11 to drop with the slope of the hill and the right ski 10 to rise with the slope of the hill. In traversing back across the hill in the opposite direction the skis 10 and 11 assume the opposite positions as seen in FIG. 4.

Relative to water skiing, the tow rope may be held in hand or tied to the device. The action and technique is substantially the same as in water skiing relative to following the tow boat and line pull. The traverse of a water skier is limited by the angle of the tow line relative to the tow boat.

In traversing in water skiing, the frame may be angled with the skis plowing against the water surface as indicated by the broken line Y.

As in riding a bicycle, when the skier rides the device of the invention across the slope of a hill in a traverse as he approaches the side of the slope or when he reaches the end of his rope angle in water skiing, he must make a U-turn to make a reverse traverse back across the hill or back across the line of the tow boat. In coming into the U-turn, the rider turns the levers 14 and 15 or the handlebars 19 to incline the front ski 18 and moves his body and the frame thereby inclining the frame and skis against the centrifugal force involved in the turning motion so that the skis plow outwardly against the snow or water surface until the turn is completed.

Also during the turn, each ski moves from its relative uphill and downhill position or inside and outside position to an opposite relative position. Therefore, in going through the turn, the skis 10 and 11, FIGS. 4 and 8, change places. They change from the position where the right ski 10 is the uphill or inside ski and the left ski 11 is the downhill or outside ski as seen in FIG. 8 to a position where the right ski 10 is the downhill or outside ski and the left ski 11 is the uphill or inside ski as seen in FIG. 4 or vice versa.

In changing their relative positions, the skis lie in the same horizontal plane about midway in the turn at which point the skier is going directly downhill on snow or forward on water. Here the skis may lie side-to-side relative to each other. However, they may lie at an angle to the surface due to the right or left hand tilting of the frame and skier to offset the centrifugal force involved in the turn. This tilts the skis up sidewise in a plowing action against the snow or water.

Thus, in turning, the skier manipulates the hand levers 14 and 15, or turns the handlebars 19 and inclines the levers or handlebars and frame sidewise and moves his body sidewise thereby sidewise inclining the drum 41. This inclines the sleeve 34 and the pin 35 sidewise. The sidewise inclination of the sleeve 34 and pin 35 causes the legs to incline sidewise to thereby incline the skis 10 and 11 sidewise. This is closely analogous to turning a bicycle. This bicycle however, rolls on the periphery of the tires. In the instant device, such as in a right turn, the inclination of the levers or handlebars to the right causes the articulated linkage 12 to operate to allow the right ski to move upwardly and the left ski to move downwardly as they tip sidewise to the right.

Conversely, in turning the device to the left, the skier inclines the handlebars or levers, and the frame to the left permitting the left ski to move upwardly and the right to move downwardly. However, the skis maintain their parallel relationship so that an incline sidewise to

the hill or water surface produces a sidewise plowing action supporting the device against the centrifugal force involved in the turn relative to the surface of the hill or the water.

The skis 10 and 11 are shown in opposite relative positions in FIGS. 4 and 8. FIG. 4 shows that the left ski 11 may be raised and the right ski 10 lowered relative to each other while the frame and skier remain vertical such as in a traverse in one direction across the slope of a hill X or across the line of tow in water skiing. FIG. 8 shows that the right ski 10 may be raised and the left ski 11 lowered relative to one another while the frame and skier remain vertical such as in a traverse in the other direction across the slope of a hill or across the line of tow in water skiing.

In both FIGS. 4 and 8, the edges of the skis bite into the hill X or water preventing side-slipping. This is effected by the skis never tilting sidewise relative to the frame. The skis always lie normal to the frame. This is true not only when the frame is vertical but also when the frame is inclined to the vertical. Thus, inclining the frame sidewise to the right or left inclines the skis sidewise to the right or left regardless of whether the skis are up or down relative to each other.

With equal weight distribution between the skis on a slanting snow surface or a relatively slanting water surface the skis automatically position themselves relative to the surface with the frame lying in a plane normal to the skis. This is permitted by the articulation of the linkage and the cross-connection of the beam portions in their scissoring action. The cross-connection of the beam portions, their scissoring action, and the pivotal connection to the front legs and the skis, also allows the skier to incline the frame to the vertical to incline the skis 10 and 11 not only to a horizontal surface but also to a surface inclined to the horizontal.

While only two embodiments of the invention have been disclosed and described in detail, it is obvious that many changes may be made in the size, shape, detail, and arrangement of the various elements of the invention within the scope of the appended claims.

I claim:

1. A vehicle for controlled sliding on a surface such as water and snow comprising
 - paired spaced right and left skis,
 - a front bearing on each said ski,
 - a back bearing on each said ski spaced rearwardly from said front bearing,
 - a front leg on each said ski having a bottom foot pivotally connected to each said front bearing and a top knee having a knee joint aperture,
 - a back leg on each said ski having a bottom foot pivotally connected in each said back bearing and an upper end;
 - said back and front legs pivoting forwardly and rearwardly in said bearings relative to said skis,
 - said back and front legs, said feet, and said bearings preventing sidewise pivoting between said skis and said legs so that they must incline sidewise together,
 - a transverse tube having one end fixed to the upper end of one said rear leg and a second end,
 - a first middle leg having a rear end fixed on said tube second end and a front end pivotally connected to the opposite front leg knee joint aperture; said rear leg, middle leg, and said tube being fixedly interconnected and constituting a beam portion;
 - a pivot pin rotatably lying in said transverse tube having one end fixed to said other rear leg and a second end,
 - a second middle leg having a rear end fixed to said pin second end and a front end pivoted to said other opposite front leg knee joint aperture; said rear leg, middle leg, and said pin being fixedly interconnected and constituting a beam portion;

said beams both leading from the rear of one said ski to the front leg of the other said ski;

said tube and pin pivotally interconnecting said beam portions in a scissoring action wherein the front and rear portions of each beam pivot in opposite directions;

each said ski being attached to the front of one beam portion and the rear of the other beam portion so that in beam scissoring action one said ski rises with the front of one said beam and the rear of the other said beam as the other said ski drops with the rear of one said beam and the front of the other said beam;

and means for controlling the scissoring and pivoting of said legs relative to one another.

2. A vehicle for controlled sliding on a surface such as water and snow comprising

paired spaced right and left skis,

a front leg pivotally connected to each said ski,

a back leg having a bottom end pivotally connected to each said ski and an upper end;

said back and front legs pivoting forwardly and rearwardly relative to said skis,

said back and front legs pivotal connections to said skis preventing sidewise pivoting between said skis and said legs so that they must incline sidewise together;

a first middle leg having a rear end fixed to one said rear leg and a front end crossing over and pivotally connected to the opposite front leg, said middle and rear legs constituting a beam portion;

a second middle leg having a rear end fixed to said other rear leg and a front end crossing over and pivotally connected to said other opposite front leg;

said middle and rear legs constituting a beam portion; means pivotally interconnecting said beam portions for scissoring action;

said beam portions both leading from the rear of one said ski to the front leg of the other said ski;

said means pivotally interconnecting said beam portions in a scissoring action so that the front and rear portions of each beam pivot in opposite directions; each said ski being attached to the front of one beam portion and the rear of the other beam portion so that in beam scissoring action one said ski rises with the front of one said beam and the rear of the other said beam as the other said ski drops with the rear of one said beam portion and the front of the other said beam portion;

and means for controlling said beam portions scissoring action and said front legs pivoting action.

3. In a device as set forth in claim 2, said means for controlling said beam portions scissoring action and said front legs pivoting action comprising paired hand levers connected to one said beam portions and said front legs adjacent their pivotal connection to each other.

4. In a device as set forth in claim 2, said means for controlling said beam portions scissoring action and said front legs pivoting action comprising,

a drum around said means pivotally interconnecting said beam portions,

a bar fixed on said drum having an end extending forwardly past said skis,

a sleeve fixed transversely on said bar extending end; said sleeve having a bottom end,

a rod pivotally lying in said sleeve having a boss abutting said sleeve bottom end for supporting said sleeve on said bar; said rod having top and bottom ends extending upwardly and downwardly relative to said sleeve;

handle bars fixed to said rod upper end, a front ski fixed to said rod lower end, and a seat on said bar.

5. In a device as set forth in claim 4, means connected between one said drum and bar pre-

venting drum and bar free pivotal movement to hold said front ski relative to said paired skis.

6. A controlled ski device comprising, 5
 paired skis having front and rear ends,
 a frame pivotally mounted on the front and rear ends of each said ski for front to rear pivotal relative movement between said frame and skis;
 said frame including articulated linkage having pivoted scissoring beam portions cross-connected between the front and rear ends of opposite skis allowing said skis 10
 to rise and lower relative to one another while lying substantially parallel to one another in conjunction with frame and ski pivotal movement,
 said frame and skis selectively inclining sidewise together in conjunction with beam scissoring action 15
 and up and down ski movement to provide control relative to weight distribution in conjunction with gravitational and acceleration forces;
 and hand control means on said frame for controlling said linkage. 20

7. In a device as set forth in claim 6,
 said hand control means comprising
 hand levers for scissoring said beam portions.

8. In a device as set forth in claim 6,
 said hand control means comprising 25
 a bar leading from said beams at their pivot point, and handlebars on said bar;
 said handlebars and bar operating said linkage by side-to-side movement relative to said skis.

9. An articulated vehicle for sliding on water and on 30
 snow having articulated linkage for effecting control in turning and traversing relative to a hill fall-line comprising,
 paired spaced parallel right and left skis, 35
 a front bearing and a rear bearing on each said ski,
 paired right and left front legs and paired right and left back legs having feet pivoted in said bearings for permitting front and rear swinging movement of said legs relative to said skis and for preventing sidewise swinging movement between said legs and said skis; 40
 all said legs having upper ends;
 paired right and left middle legs each having a front

end respectively pivotally connected to said right and left front leg upper ends forming a knee joint and a rear end leading to a point adjacent said rear legs upper ends,

a transverse tube fixed between opposite middle and rear legs such as said left middle leg rear end and said right rear leg upper end,

a pivot pin in said tube having projecting ends fixed between said other opposite middle leg and rear leg such as said right middle leg rear end and said left rear leg upper end,

said right rear leg and left middle leg pivoting at said pin and tube as a cross-connected walking beam between said rear bearing on said right ski and said left front leg top end with said left front leg bottom end pivoting at said left front bearing on said left ski;

said left rear leg and right middle leg pivoting at said pin and tube as a cross-connected walking beam on said left rear bearing on said left ski and said right front leg top end with said right front leg bottom end pivoting at said right front bearing on said right ski, said left ski front end being pivotally connected thereby to said right ski rear end;

said right ski front end being pivotally connected thereby to said left ski rear end;

said pivot pin and tube providing relative rotation between said beam portions for a scissoring action with each said beam portions front ends moving in opposite directions and rear ends moving in opposite directions resulting in the rear end of one beam and the front end of the other beam rising with one ski and the front end of one beam and the rear end of the other beam lowering with one ski.

References Cited in the file of this patent

UNITED STATES PATENTS

2,814,811	Ritter et al. -----	Dec. 3, 1957
-----------	---------------------	--------------

FOREIGN PATENTS

511,507	Germany -----	Oct. 30, 1930
928,569	Germany -----	June 2, 1955
453,644	Italy -----	Dec. 9, 1949