April 23, 1968 H. A. RASS 3,379,449

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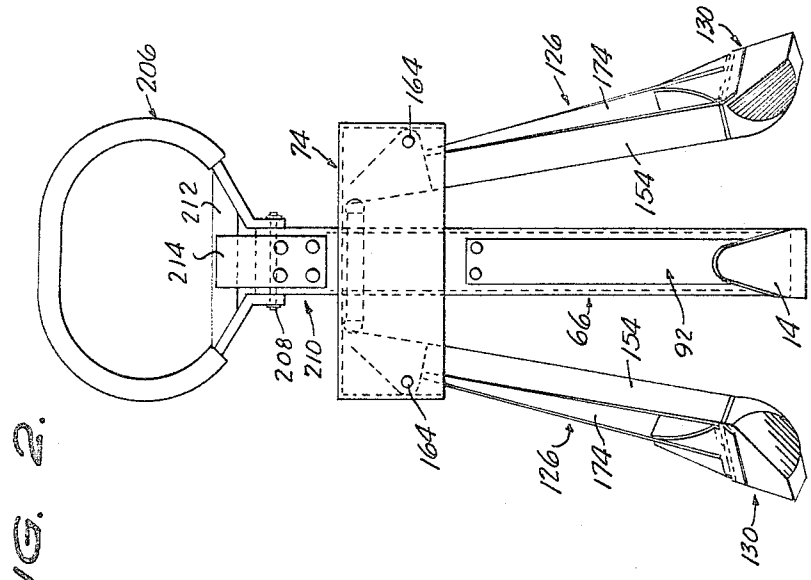


FIG. 2.

FIG. 1.

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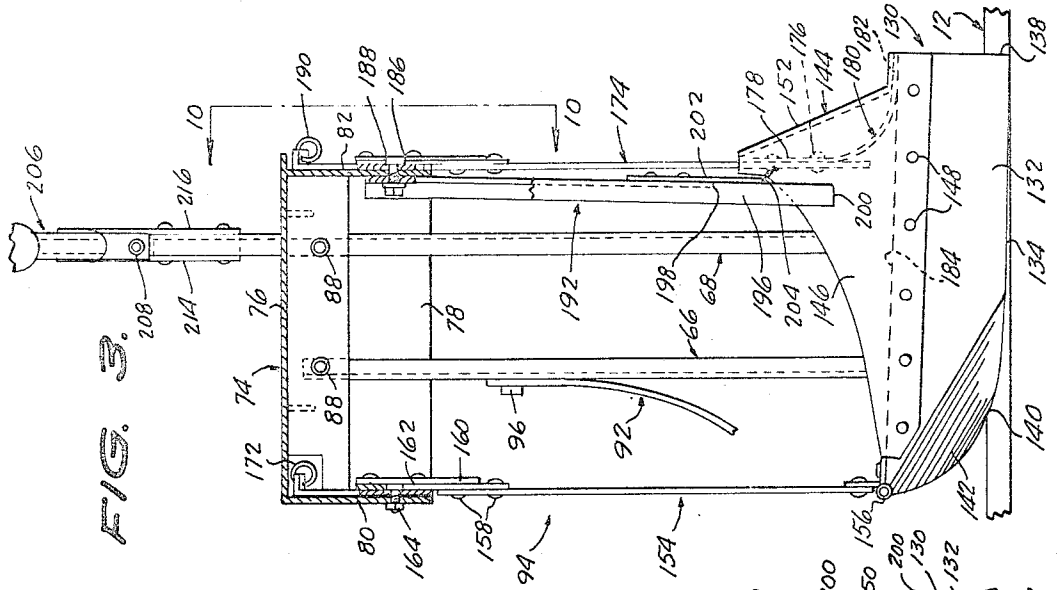


FIG. 3.

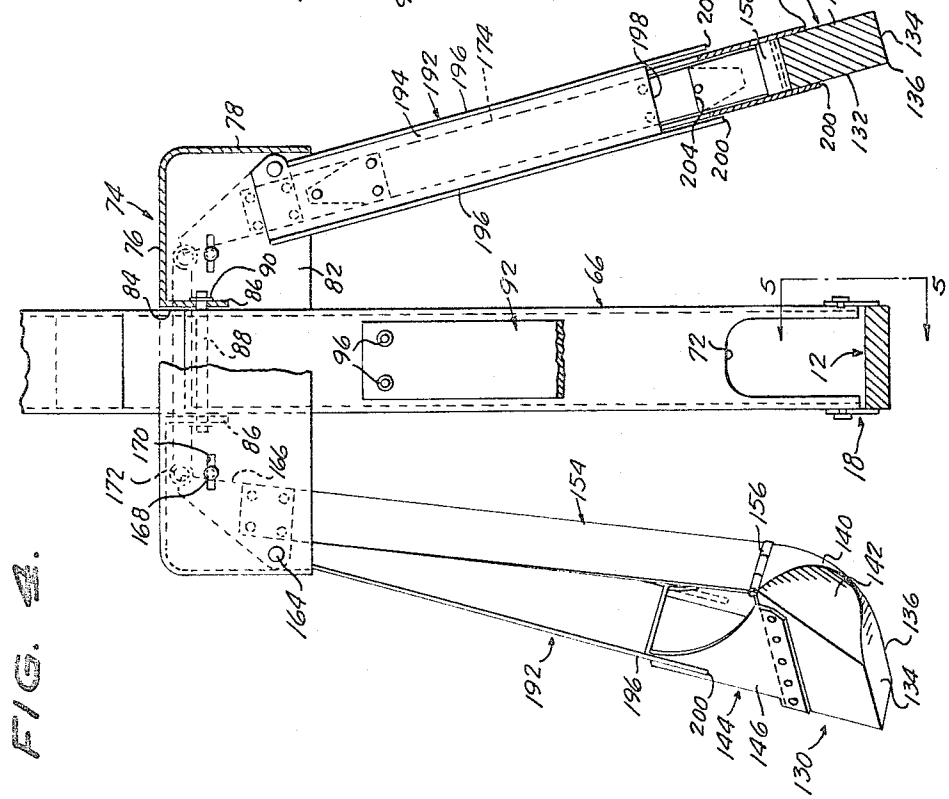


FIG. 4.

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FIG. 5.

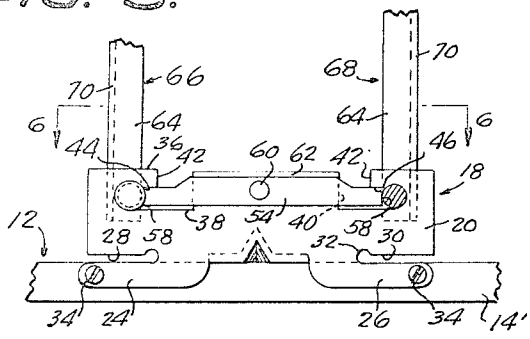
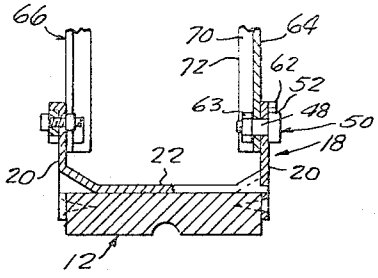


FIG. 7.



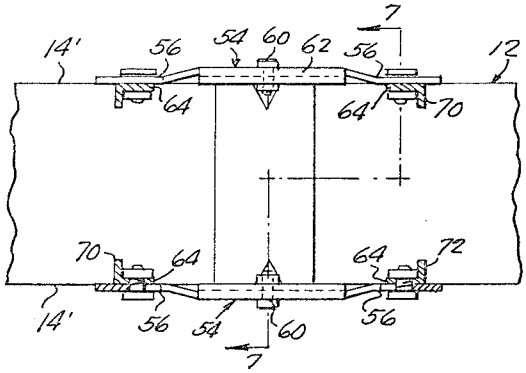


FIG. 6.

FIG. 10.

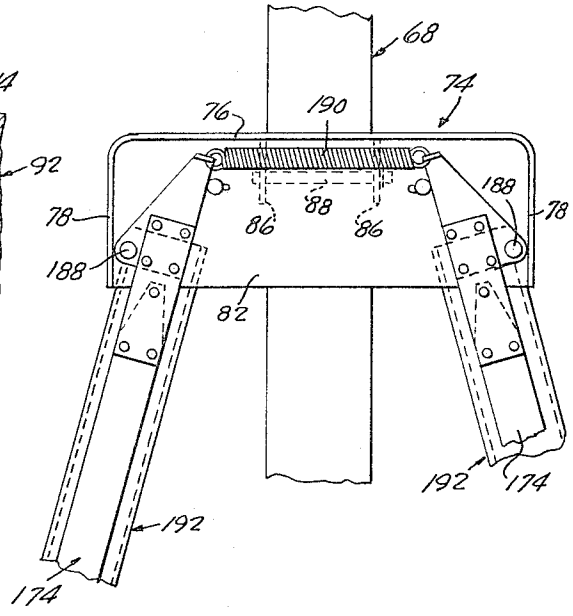


FIG. 8.

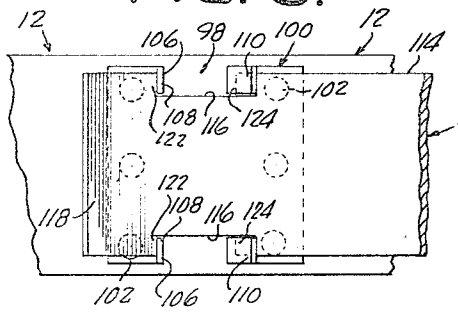
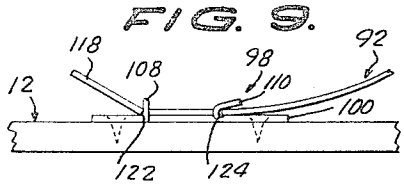


FIG. 9.



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3,379,449

SKI

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Filed Nov. 1, 1966, Ser. No. 591,296
9 Claims. (Cl. 280—12)

This invention relates to a ski having a movable handle and ground-engaging outriggers.

The primary object of the invention is the provision of a device of the kind indicated, which renders single-runner skiing safer, more feasible, and more easily controlled, for use by beginners, children, and other inexperienced or physically unconditioned persons, as well as by more skilled persons.

In skiing maneuvers, especially in executing turns, some difficulty and danger is present for the less experienced skier, especially at higher speeds, which difficulty and danger are eliminated or substantially reduced by the presence, on the device, of resiliently mounted outriggers, having ground-engaging shoes, whose action is to prevent over-tilting of the device as the device is edged to make turns.

In the drawings:

FIGURE 1 is a left-hand side elevation of a device of the invention;

FIGURE 2 is a front elevation of the device;

FIGURE 3 is an enlarged fragmentary left-hand side elevation of the device, partly broken away and in section;

FIGURE 4 is an enlarged front elevation of the device, partly broken away and in section;

FIGURE 5 is a further enlarged fragmentary side elevation, taken from the line 5—5 of FIGURE 4;

FIGURE 6 is a horizontal section, taken on the line 6—6 of FIGURE 5;

FIGURE 7 is a vertical section, taken on the line 7—7 of FIGURE 6;

FIGURE 8 is a fragmentary horizontal section, on the scale of FIGURE 7, taken on the line 8—8 of FIGURE 1;

FIGURE 9 is a side elevation of FIGURE 8; and,

FIGURE 10 is a fragmentary rear elevation, taken from the line 10—10 of FIGURE 3.

Referring in detail to the drawings, the illustrated device comprises a substantially conventional ski runner **12**, having an upturned forward end portion **14**, and side edges **14'**. Suitably secured upon the upper surface of the runner **12**, at a conventional location thereon, is ski-boot fastening means **16**, and spaced in front of the means **16**, is a control handle base **18**.

The base **18** comprises a pair of similar, parallel side plates **20**, which, at locations intermediate their ends, are spaced and connected by a flat horizontal cross member **22**, adapted, as shown in FIGURE 7, to rest upon the upper surface of the runner **12**. On the lower edges of the side plates **20** are similar, horizontal forwardly and rearwardly extending, front and rear tabs **24** and **26**, respectively, which are separated from the lower edges of the plates, by front and rear horizontal keyhole slots **28** and **30**, respectively. At their inner ends, the slots **28**, **30** have enlarged diameter end portions **32**. At their outer ends, the tabs **24**, **26** are traversed by screws **34**, which are threaded into the side edges **14'**, of the runner **12**, for holding the base in place thereon. The tabs are bendable, to accommodate ski runners of different widths.

Formed in the horizontal upper edges **36** of the base side plates **20**, adjacent to the ends thereof, are similar front and rear notches **38** and **40**, respectively, whose outer edges **42** are formed with forwardly and rearwardly extending front and rear horizontal slots **44** and **46**, respectively. The slots **44**, **46** are provided to receive the shanks **48**, of pivot pins **50**, having enlarged heads **52**, on

their outer ends. The heads **52** bear against the outer sides of the side plates **20**. The pins **50** are held in the slots **44**, **46** by means of horizontally elongated, relatively narrow retainers **54**, having inwardly deflected end portions **56**, whose ends **58** engage the shanks **48**. The retainers are held removably in place on the outer sides of the side plates, by bolts **60**, traversing the side plates and the retainers. As shown in FIGURE 7, the retainers have, on their upper edges, outwardly extending flanges **62**, which bear upon the upper edges of the side plates.

The headed pins **50** can, as shown in FIGURE 7, be in the form of bolts whose shanks **48** extend through the side flanges **64**, of front and rear upstanding channel standards **66** and **68**, respectively, and have thereon nuts **63**, bearing against the inner sides of the flanges. The standards **66** and **68** have webs **70**. The web of the rear standard **68** is formed, from its lower edge, with a notch **72**, large enough to provide clearance, if desired, for the toe of a ski boot (not shown) fastened on the runner **12**, behind the base **18**. The standards **66**, **68** are otherwise similar, and are of the same height, but are in reversed relation to each other, the opening of the front standard facing to the rear and the opening of the rear standard to the front. The rear standard extends above and is longer than the front standard. The above-described arrangements of the standards provides for their swinging forwardly and rearwardly, in parallelism, relative to the base **20**.

A hollow rectangular saddle **74** is mounted on the upper ends of the standards **66**, **68**. The saddle **74** comprises a horizontal top wall **76**, parallel side walls **78**, and parallel front and rear walls **80** and **82**, respectively, and is open at its bottom. The top wall **76** is formed with a central longitudinal parallel sided slot **84**. On the top wall are pendant longitudinal walls **86** which extend to and are fixed to the front and rear walls **80**, **82**.

At intervals spaced from the front and rear walls, of the saddle **74**, and at points spaced from each other, the pendant longitudinal walls **86** are traversed by transverse horizontal hinge pins **88**, which traverse also the side flanges of the front and rear standards **66**, **68**. The hinge pins **88** are held in place, as by means of snap rings **90**, engaged on their ends, and bearing against the outer sides of the pendant walls **86**, as shown in FIGURE 4.

A downwardly and forwardly curved leaf spring **92**, extends downwardly and forwardly from an upper part of the front standard **66**, to the ski runner **12**, and serves to bias the handle assembly **94**, including the standards and the saddle **74**, to a normal, rearward, perpendicular relationship to the ski runner **12**. At its upper end the spring **92** is secured to the web of the front standard **66**, by suitable means, such as screws **96**. At its forward end, the spring **92** is secured to the upper surface of the ski runner **12**, by means of an anchor assembly **98**.

The anchor assembly **98** comprises, as shown in FIGURES 8 and 9, a flat rectangular plate **100**, fixed, as by means of screws **102**, to the runner **12**, at a point spaced at a substantial distance forwardly from the handle assembly base **20**, and adjacent to the upturned forward end portion **14** of the runner **12**. The plate **100** is formed, in its side edges **104**, with transversely aligned rectangular notches **106**, positioned intermediate the ends of the plate. On the forward edges of the notches **106** are upstanding ears **108**, disposed at right angles to the plate. On the rear edges of the notches **106** are upwardly and rearwardly directed lugs **110**.

At a location adjacent to the squared forward end **112**, of the spring **92**, its side edges **114** are formed with rectangular notches **116**, of a length slightly greater than the distance between the front sides of the ears **108**, and the rear sides of the bends of the lugs **110**. As shown in FIGURE 9, the terminal end portion **118**, of the spring

92, forwardly of the notches 116, is bent at an upward angle, relative to the remainder of the spring, as the narrow portion 120, of the spring between the ends of the notches 116 lies flat upon the plate 100, with the front ends 122, of the notches 116 engaged with the forward sides of the ears, and with the rear ends 124, of the notches 116, engaged with the rear sides of the bands of the lugs 110. This arrangement is achieved by engaging the rear ends of the notches 116 under the lugs 110, and then forcing the forward ends of these notches behind the ears 108.

Resilient outriggers 126 extend laterally outwardly and downwardly, at acute angles, from the saddle 74, and are mounted thereto, at their upper ends. The outriggers comprise ground-engaging shoes 130, shaped substantially like sabots, or wooden shoes, of vertical rectangular cross section, as shown in FIGURE 4, and having opposed sides 132, relative to which flat horizontal sole surfaces 134 are disposed at right angles, and have ground-engaging inner edges 136. The soles 134 terminating in rear ends 138. At their forward ends, the sole surfaces 134 have upcurved forward end portions 140, which have upwardly and laterally outwardly angled flat surfaces 142. In engagement with snow, the angled surfaces 142 tend to force the shoes 130 inwardly toward the runner 12.

Triangular longitudinal risers 144, of inverted channel form, have side walls 146, which, at their lower edges, are affixed to the sides of the shoes, as indicated at 148. The risers 144 have top walls 150, which form downwardly and forwardly bowed ramps, which at their elevated rear ends, are close to the upper ends of rear walls 152, of the risers.

Flat, normally erect front spring struts 154, which normally are disposed at acute outward angles, relative to the runner 12, are transversely hinged, at their lower ends, as indicated at 156, to the forward ends of the shoes 130. At their upper ends, the front struts 154 have affixed, as indicated at 158, to their rear sides, spring reinforcing plates 160, which extend thereabove. Right triangular plates 162 are affixed to the front sides of the plates 160 and extend thereabove. At their laterally outward corners, where their base and hypotenuse edges intersect, the plates 162 are pivoted, as indicated at 164, to the front wall 80, of the saddle 74, at locations near the saddle side walls 78. The altitude edges 16, of the plates 162 are adapted to bear against stops 168, which are adjustable in horizontal slots 170, in the saddle front wall. A contractile coil spring 172 is stretched between and is connected to the upper ends of the plates 162.

Rear spring struts 174, generally similar to the front struts 154, are fixed, at their lower ends, as indicated at 176, to the front sides of the vertical portions 178, of bowed flat springs 180, which are suitably fixed, at their horizontal rear ends, as indicated at 182, to the flat horizontal upper surfaces 184, of the shoes 130.

At their upper ends, the rear struts 174 have flat triangular plates 186, similar to the front strut plates 162, which are pivoted, as indicated at 188, to the rear sides of rear wall portions 82, of the saddle 74, and have a contractile coil spring 190 stretched between and connected to their upper ends.

The outriggers 126 further comprise relatively rigid, shallow channel arms 192, having webs 194, and forwardly extending side walls 196. The webs 194 terminate in lower ends 198, which are spaced upwardly from the lower ends 200, of the side walls 196. At their lower ends, the side walls 196 slidably engage the inner and outer sides of the risers and the shoes. The channel arms 192, at their upper ends, have their webs pivoted, at the front sides of the saddle rear wall portions 82, on the pivots 188, of the rear struts 174.

Relatively short flat spring tongues 202 are affixed to the rear sides of the webs of the channel arms and extend below the lower ends 198, of the latter, and the tongues have lower ends 204, which bear slidably upon the bowed top walls 150 of the risers 144.

A transverse vertical loop handle 206 is transversely pivoted, as indicated at 208, to structure 210, on the upper end of the rear standard 68, which extends above the saddle 74, and forward and rearward movements of the handle 206, relative to the standard 68, are restricted by engagement of a cross member 212 of the handle, with flat front and rear spring leaves 214 and 216, of said structure.

In use and operation, the skier having one booted foot secured upon the runner 12, and the ski being in motion over the ground, with the skier holding the handle 206, turns to either side and returns to erect position, are made by edging the runner 12, in the usual manner, while using lateral pressure upon the handle 206, in a manner to edge the shoes 130 and cause the related outriggers to move outwardly, relative to the runner 12, so as to cause the shoes to have supportive engagement with the ground. This limits and controls tilting of the ski and prevents unsafe overtilting thereof. To come out of a turn, reverse pressure is applied to the handle 206, accompanied by the usual de-edging of the runner 12.

Pushing forwardly on the handle 206, causes the forward end of the runner 12 to bear more heavily on the ground, while pulling rearwardly on the handle relieves this pressure, and can be used to put more than normal pressure, on the ground, of the rear part of the runner.

What is claimed is:

1. A ski comprising a runner having an upturned forward end portion, a ski boot fastening assembly secured upon the upper surface of the runner at a location intermediate the ends of the runner, a base secured to the runner at a location spaced between the forward end portion of the runner and said fastening assembly, said base extending above the runner, spaced upstanding front and rear standards pivoted at their lower ends on said base about substantially transverse axes, a saddle overlying the front standard, the rear standard rising above the saddle, the standards being pivoted to the saddle about substantially transverse axes, an upstanding handle connected to said saddle and standards, and outriggers extending downwardly from the saddle at opposite sides of the standards, said outriggers being pivoted adjacent to their upper ends to the saddle about substantially longitudinal axes, spring means acting between the outriggers at points above the pivotal points of the outriggers, said spring means serving to bias the lower ends of the outriggers laterally outwardly relative to the base, said outriggers normally occupying outwardly and downwardly angled positions relative to the base, and ground-engaging shoes on the lower ends of the outriggers.

2. A ski according to claim 1, wherein said outriggers comprise front and rear vertically elongated spring struts, said struts being severally pivoted at their upper ends to the saddle at longitudinally spaced points on the saddle, the lower ends of said struts being secured to longitudinally spaced points on the shoes.

3. A ski according to claim 1, wherein said outriggers comprise front and rear vertically elongated spring struts, said struts being severally pivoted at their upper ends to the saddle at longitudinally spaced points on the saddle, the lower ends of said struts being secured to longitudinally spaced points on the shoes, said outrigger struts being resilient and flexible, with the front struts pivoted to the shoes, and the rear struts fixed to the shoes.

4. A ski according to claim 1, wherein a downwardly bowed leaf spring extends between the front standard and the ski runner, said spring having an upper end fixed to the upper part of the front standard and a lower end secured upon the upper surface of the ski runner at a location spaced between the base and the forward end portion of the ski runner, said leaf spring serving to bias the standards toward and in erect positions.

5. A ski according to claim 1, wherein a downwardly bowed leaf spring extends between the front standard and the ski runner, said spring having an upper end fixed to the upper part of the front standard and a lower

end secured upon the upper surface of the ski runner at a location spaced between the base and the forward end portion of the ski runner, said leaf spring serving to bias the standards toward and in erect positions, said standards being in spaced parallel relationship.

6. A ski according to claim 1, wherein a downwardly bowed leaf spring extends between the front standard and the ski runner, said spring having an upper end fixed to the upper part of the front standard and a lower end secured upon the upper surface of the ski runner at a location spaced between the base and the forward end portion of the ski runner, said leaf spring serving to bias the standards toward and in erect positions, and an anchor assembly fixed upon the upper surface of the ski runner, the forward end of the leaf spring being releasably engaged with the anchor assembly.

7. A ski according to claim 1, wherein said outriggers comprise front and rear vertically elongated spring struts, said struts being severally pivoted at their upper ends to the saddle at longitudinally spaced points on the saddle, the lower ends of said struts being secured to longitudinally spaced points on the shoes, said outrigger struts being resilient and flexible, with the front struts pivoted to the shoes, and the rear struts fixed to the shoes, said shoes having flat ground-engageable soles having heel ends and upturned forward end portions, the forward outrigger struts being hinged to the forward ends of the shoes at the elevated ends of said upturned shoe soles, said shoes having risers thereon to which the lower ends of the rear outrigger struts are flexibly secured.

8. A ski according to claim 1, wherein said outriggers comprise front and rear vertically elongated spring struts, said struts being severally pivoted at their upper ends to the saddle at longitudinally spaced points on the saddle, the lower ends of said struts being secured to longitudinally spaced points on the shoes, said outrigger struts being resilient and flexible, with the front struts pivoted to the shoes, and the rear struts fixed to the shoes, said shoes having flat ground-engageable soles having heel ends and upturned forward end portions, the forward outrigger struts being hinged to the forward ends of the shoes at the elevated ends of said upturned shoe soles, said shoes having risers thereon to which the lower ends of the rear outrigger struts are flexibly secured, said soles normally occupying outwardly and upwardly angled positions relative to the horizontal, said shoes having squared inner edges at the inner edges of the soles.

9. A ski according to claim 1, wherein said outriggers comprise front and rear vertically elongated spring struts, said struts being severally pivoted at their upper ends to the saddle at longitudinally spaced points on the saddle, the lower ends of said struts being secured to longitudinally spaced points on the shoes, said outrigger struts being resilient and flexible, with the front struts pivoted to the shoes, and the rear struts fixed to the shoes, said shoes having flat ground-engageable soles having heel ends and upturned forward end portions, the forward outrigger struts being hinged to the forward ends of the shoes at the elevated ends of said upturned shoe soles, said shoes having risers thereon to which the lower ends of the rear outrigger struts are flexibly secured, said risers having downwardly and forwardly bowed top walls, relatively rigid vertical arms located in front of the rear struts, said rigid arms having webs and forwardly extending side walls, the webs of the rigid arms being pivoted to the saddle on the same axes as the rear struts, said side walls extending below the lower ends of the webs and being engaged with the sides of the risers and the shoes, said webs having fixed spring tongues extending below the webs and slidably engaged with the bowed top walls of the risers.

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