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E. BJORK

2,225,293

SKI

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Fig. 1.

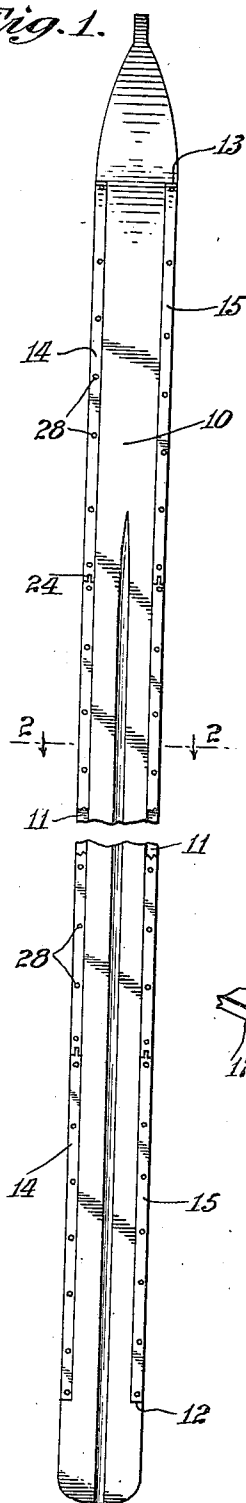


Fig. 2.

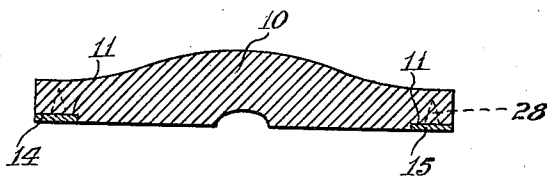


Fig. 3.

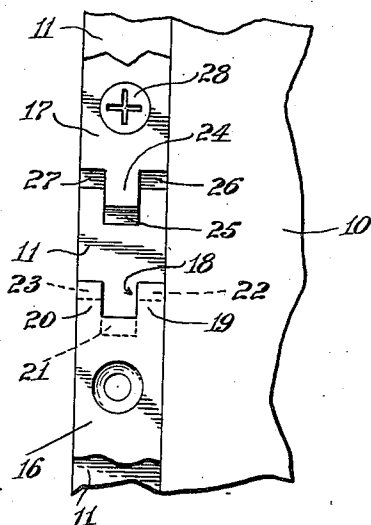


Fig. 5.

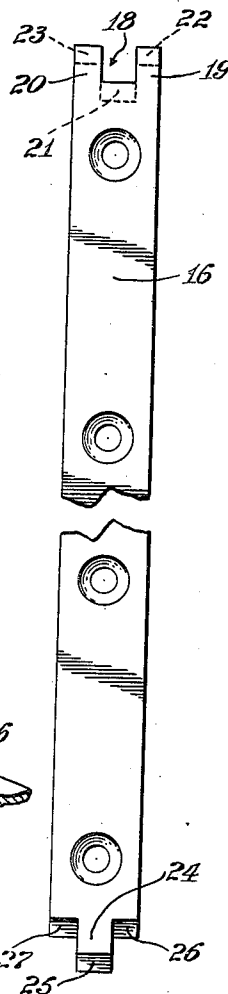
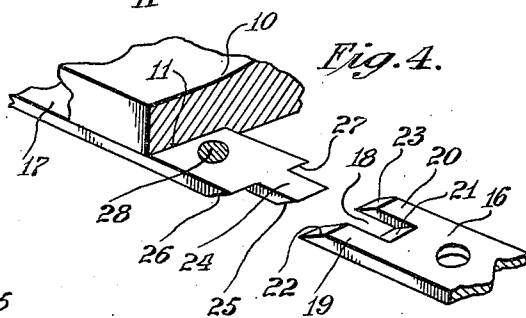


Fig. 4.



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2,225,293

SKI

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4 Claims. (Cl. 280—11.13)

The invention relates to skis, and more particularly to a ski provided with metal runners along the opposite edges thereof.

In skiing, speeds as high as 50 and 60 miles per hour are attained at times, over a course sometimes having portions thereof requiring abrupt turns, and the usual practice at the end of a course is for the skier to check his speed of travel by a turn at a sharp angle to his direction of movement.

When making turns, it is customary for the skier to ride upon one edge of the skis, this edge biting into the snow on the course and thus developing a sort of braking action during which the ski is subjected to severe lateral strains.

On ski courses, or in the open country in which skiing is done, snow upon the course may contain ice, dirt, stones, twigs or other rough spots which the skis must slide over freely to avoid "spilling" of the skier.

Skis themselves possess considerable flexibility, the wood of the ski having a slight longitudinal arch extending throughout the central portion of the ski, and during a run there is constant flexure of the ski according to the conditions in different portions of the course.

With the above conditions in mind, I have provided a ski having metal edge runners which are so constructed as to permit free flexure of the ski while affording a high degree of protection to the side edges, and at all times ensuring sharp, substantially continuous, wear resisting bottom edges effective in assisting the skier when making sharp turns. Such protecting runners must be made in short lengths and have a degree of resiliency equalling, if not greater than, the wood of the ski itself.

The short sections must be so secured in relation to the ski and to each other as to prevent any vertical or lateral displacement of any part of the runner, since any forwardly and downwardly presented edge of any section of the runner would bite into the snow on the course in a manner to impede the progress of the skier and possibly cause an upset which might result in injury to the skier.

The arrangement is such that there can be no relative displacement of the ends of succeeding sections of the runner, and yet the runners, throughout their entire length, will have the desired degree of flexibility or resiliency. By preventing such displacement of the runners, there is no possibility of the ends of any section being bent in a manner to prevent free sliding movement of the ski as a result of contact with

stones, twigs, ice, earth or other matter along the course.

The construction of the runner and the manner of applying it to the ski is such as to have no weakening effect upon the wood of the ski, but rather to provide a reinforcement along each edge thereof without sacrificing resiliency of the ski as a whole.

The various sections of each runner are exact replicas of all other sections, excepting as to those sections which are positioned toward the front and toward the rear of the ski. By having the sections so former, it is possible to produce a number of sections at a time, using the same tools, and great accuracy in the alinement of succeeding sections in making up a runner is secured. Furthermore, the construction of the joint between succeeding sections is such as to utilize the thickness of the metal of the strip in a manner to eliminate all danger of breakage of the material about the joint, and to eliminate any seams at the joints which might provide an edge or edges which would bite into foreign matter on the course and thus interfere with the free running of the ski.

The invention consists primarily in a ski having a rabbet at each edge of its under face extending from adjacent the rear into the curved portion of the front thereof, and a metal runner of substantially the same width, depth and length as said rabbet, whereby the outer face of said runner is substantially flush with the bottom face, and its edge is substantially flush with the edge, of the ski, said runner being composed of a plurality of short sections, one end of each of said sections having a central, longitudinally extending channel forming edge extensions upon opposite sides thereof, and the end of the adjacent section having a tongue adapted to enter said channel, the end of said tongue and the metal of said section beyond said channel being provided with complementary gradually reduced overlapping portions, the portion toward the rear of the ski underlaying the portion toward the front of the ski, whereby relative vertical and lateral movements of the ends of adjacent sections are prevented, and means securing each section to the ski; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a condensed view of a ski embodying the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1 upon a larger scale;

Fig. 3 is a view of a fragmentary portion of the bottom of a ski upon an enlarged scale, showing the construction of the ends of adjacent sections, the rearward section being secured to the ski and the forward section being in a position to be engaged and interlocked with said rear section;

Fig. 4 is a perspective view of the parts as shown in Fig. 3; and

Fig. 5 is a condensed view upon the same scale as Figs. 3 and 4 of one of the runner sections.

Like numerals refer to like parts throughout the several views.

In the embodiment of the invention shown in the drawing, the ski proper 10 is composed of wood and is of the usual form. Along each side edge of the ski is a rabbet 11 which extends from a point 12 adjacent the rear of the ski to a point 13 in the upwardly curved front portion of the ski. The rabbet at the point 13 terminates before the ski is laterally contracted or brought to a point, although well above the plane of the bottom of the ski.

In actual practice, the rabbet has a depth of approximately .05 of an inch and a width of about $\frac{1}{8}$ of an inch.

Along opposite edges of the ski, are metal runners 14 and 15. These runners are made of metal strips of a width and thickness corresponding with the width and thickness of each rabbet 11, so that the outer edge of each runner will be substantially flush with the outer edge of the ski, the lower face or bearing surface thereof will be substantially flush with the bottom of the ski, and the inner edge of each runner will bear against the inner edge of the rabbet. In this manner a lower face, which is flush throughout, is provided, thus avoiding any projections which will interfere with the ordinary movements of the ski while in use.

Great nicety in this arrangement is not required, since any irregularities will be so small as to be negligible. The strip metal used is only about .05 of an inch in thickness, and variation in the thickness of a few thousandths of an inch one way or another would not interfere in any way with the free action of the ski.

The use of thin metal in the runner is essential because these runners must have as great or greater flexibility than the material of the ski itself, since such flexibility is necessary to the desired action of the ski.

In actual practice, I have found it to be necessary to make the runners in sections, each section being secured to the ski entirely independently of the other sections, and the ends of adjacent sections being so formed and so joined as to not only prevent the movement of the end of any section laterally of the ski, but also vertically thereof, to an extent to permit this end to bite into any material on the course in a manner to interfere with the free sliding of the ski, and the bending of this end outwardly of the lower face of the ski in a manner to suddenly check movement of the ski with the resultant "spilling" or "up-setting" of the skier.

In forming the joint, the end formation of one of the sections must be such as to extend across the seam or seams of the joint, and this end section must also be provided with means co-operating with the end of the adjacent section toward the front of the ski to not only prevent any possible lifting of the forward end of the rearward

section, but to prevent any possible side movement of either of the adjacent sections. This interlocking of the ends of adjacent sections relieves the means used in securing each section to the ski from side shearing stresses and from outward pulls thereon due to movement of one section in relation to the other. Hence, small securing means, which will have little or no tendency to weaken the material of the ski proper 10, may be used.

In Figs. 3 and 4 of the accompanying drawing, there is shown in detail the construction of the co-operating ends of two adjacent sections, Fig. 3 showing these parts from the bottom of the ski and Fig. 4 showing them from the top in perspective with the ski broken away.

Referring to the drawing, the forward section is shown at 16 and as being as yet unattached to the ski or positioned in relation to the rearward section 17. The section 16 has centrally thereof, a channel 18 forming side edge extensions 19 and 20, the former of which is substantially flush with the edge of the ski, and the latter of which is in close abutting relation to the wall of the rabbet 11.

The portion of the metal of the section 16 forwardly of the channel 20 is provided with an inwardly and forwardly undercut bevel 21, and the ends of the extensions 19 and 20 are provided with bevels 22 and 23 parallel with the bevel 21.

The rearward section 17 is provided with a central and forwardly projecting tongue 24 adapted to enter and have a close sliding fit with the channel 18, the end of this tongue being inwardly and forwardly bevelled at 25 so as to pass below and interlock with the bevel 21. The shoulders on opposite sides of the tongue 24 are provided with bevels 26 and 27 adapted to form a sort of scarf joint with the bevels 22 and 23 when the ends of adjacent sections are brought together.

Bevels are used because with metal strips which, in order to have the desired degree of flexibility, must be thin, the formation of bevels permits the use of the maximum strength of the metal. Furthermore, a special tool may be used for simultaneously forming the corresponding ends of a number of such sections, thus ensuring absolute uniformity in, or interchangeability of, all of the sections.

It will be noted that the construction of the runners upon opposite sides of the ski is identical, none of the parts being right or left.

Each of the sections making up each runner is provided with screw openings each having a countersink so as to bring the heads of the screws 28 slightly above the bottom plane of the ski.

As shown particularly in Figs. 2 and 3, one screw 28 is located close to the ends of each section, so as to resist vertical displacement of this end, and the remaining screws are placed at intervals, or upon centers of approximately two inches. If the sections are a foot in length, six screws are used, it having been found highly desirable not to attempt to reduce the number of such screws.

While, in the accompanying drawing, I have shown an arrangement in which the tongues 24 project in the direction of movement of the ski, it is obvious that this arrangement may be reversed by reversing the direction of inclination of the various bevels.

The action of a ski embodying the invention is substantially as follows:

It will be noted that the construction of each of the runners is such as to provide a continuous plane surface throughout that portion thereof

co-extensive with the bearing portion of the bottom of the ski, and that each runner, as to every portion thereof, will adapt itself to the changing conditions of this surface, due to the vertical flexing of the ski.

The side extensions 19 and 20 and the tongue 24 of each joint extend across the seams at the joint so as to provide a substantially continuous bearing surface, notwithstanding the sectional structure of the runner.

Each section is held firmly against the bottom of the rabbet by the screws or other securing means 28, and the various co-operating bevels result, when the sections are assembled, in a runner of uniform thickness throughout.

The bevel 25, passing below the bevel 21, holds the tongue 24 against vertical displacement. The bevels 22, 23, 26 and 27, being positioned rearwardly of the tongue 24, during movement of the ski, supplement the action of the bevels 21 and 25 in holding the succeeding rearward section of the runner against the bottom of the rabbet 11.

Should the extensions 19 and 20 have slight vertical movement with flexing of the runner, this is immaterial, since such flexing will not present any sharp edges forwardly of the ski, and the load will tend to force said extensions back into place without interfering with the free forward sliding movement of the ski.

The angle at which the various bevels are cut, and they are all cut at the same angle, may vary with varying thickness of the metal of the runner. Bevels cut at an angle of approximately 45° have been found satisfactory when cold rolled steel of approximately .05 of an inch in thickness is used for the runners.

With the construction of runner described, there will be no projecting edges presented forwardly of the ski. Consequently, if the ski passes over material which, by engagement with a projecting edge, would tend to bend the thin material of the runner, no part of the runner can take a bite upon this material which will result in such bending.

The tongue 24 is restrained on both sides thereof by the walls of the channel 18, so that when making turns, there is no possibility of the lateral stresses at the edge of the ski forcing the end of any section of the runner beyond the edge of the ski to an extent to engage an obstruction along the course which might result in the outward bending of the end of the runner, or the breaking of the material thereof.

By preventing lifting of the ends of each section, there is substantially no tendency toward the pulling out of the screws 28 adjacent said ends or intermediate the ends, since no bulging of the metal of the section can occur because the flexure of the material of the runner is in accord with the flexing of the material of the ski.

The rabbets 11 are so shallow that there is substantially no weakening of the wood of the ski proper, and the presence of the runner in this rabbet, while having no stiffening effect, will afford reinforcement in excess of any weakening which may occur.

It will be noted that the forward end of each runner is positioned well above the plane of the bearing surface of the bottom of the ski, and that this forward end, as well as the rear end, is squared instead of being provided with a bevelled tongue or bevelled extensions. This is desirable merely as simplifying the construction of the ski.

While in the drawing, section 16 having ex-

tensions 19 and 20 are positioned forwardly of the adjacent sections 17, it is obvious that by reversing the direction of the bevels, this condition might be reversed and still secure the same action so far as holding the ends of all sections against the bottom of the ski and the provision of a continuous bearing surface, are concerned.

It will be noted that the runner, upon each side of the ski, is made up of sections having the same form as the sections constituting the runner upon the opposite side of the ski, so that all sections are interchangeable.

It is not my intention to limit the invention to the precise details of construction, nor the various dimensions herein stated, since such are capable of variation and still secure the same operative effects as are herein set forth.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:

1. A ski having a rabbet at each edge of its under face extending from adjacent the rear into the curved portion of the front thereof, and a metal runner of substantially the same width, depth and length as said rabbet, whereby the outer face of said runner is substantially flush with the bottom face, and its edge is substantially flush with the edge, of the ski, said runner being composed of a plurality of short sections, one end of each of said sections having a central, longitudinally extending channel forming edge extensions upon opposite sides thereof, and the end of the adjacent section having a tongue adapted to enter said channel, the end of said tongue and the metal of said section beyond said channel being provided with complementary gradually reduced overlapping portions, the portion toward the rear of the ski underlaying the portion toward the front of the ski, whereby relative vertical and lateral movements of the ends of adjacent sections are prevented, and means securing each section to the ski.

2. A ski having a rabbet at each edge of its under face extending from adjacent the rear into the curved portion of the front thereof, and a metal runner of substantially the same width, depth and length as said rabbet, whereby the outer face of said runner is substantially flush with the bottom face, and its edge is substantially flush with the edge, of the ski, said runner being composed of a plurality of short sections, one end of each of said sections having a central, longitudinally extending channel forming edge extensions upon opposite sides thereof, and the end of the adjacent section having a tongue adapted to enter said channel, the end of said tongue and the metal of said section beyond said channel, the ends of said edge extensions and the shoulders upon the opposite sides of said tongue being provided with complementary gradually reduced overlapping portions, the portion toward the rear of the ski underlaying the portion toward the front of the ski whereby relative vertical and lateral movements of the ends of adjacent sections are prevented, and means securing each section to the ski.

3. A ski having a rabbet at each edge of its under face extending from adjacent the rear into the curved portion of the front thereof, and a metal runner of substantially the same width, depth and length as said rabbet, whereby the outer face of said runner is substantially flush with the bottom face, and its edge is substantially flush with the edge, of the ski, said runner being composed of a plurality of short sections, one

end of each of said sections having a central, longitudinally extending channel forming edge extensions upon opposite sides thereof, and the end of the adjacent section having a tongue adapted to enter said channel, the co-operating ends of said tongue and the end of said channel having complementary inwardly and forwardly directed bevels, whereby relative vertical and lateral movements of the ends of adjacent sections are prevented, and means securing each section to the ski.

4. A ski having a rabbet at each edge of its under face extending from adjacent the rear into the curved portion of the front thereof, and a metal runner of substantially the same width, depth and length as said rabbet, whereby the outer face of said runner is substantially flush

with the bottom face, and its edge is substantially flush with the edge, of the ski, said runner being composed of a plurality of short sections, one end of each of said sections having a central, longitudinally extending channel forming edge extensions upon opposite sides thereof, and the end of the adjacent section having a tongue adapted to enter said channel, the co-operating ends of said tongue and the end of said channel, the ends of said edge extensions and the shoulders upon the opposite sides of said tongue having complementary inwardly and forwardly directed bevels, whereby relative vertical and lateral movements of the ends of adjacent sections are prevented, and means securing each section to the ski.

ELIS BJÖRK.