

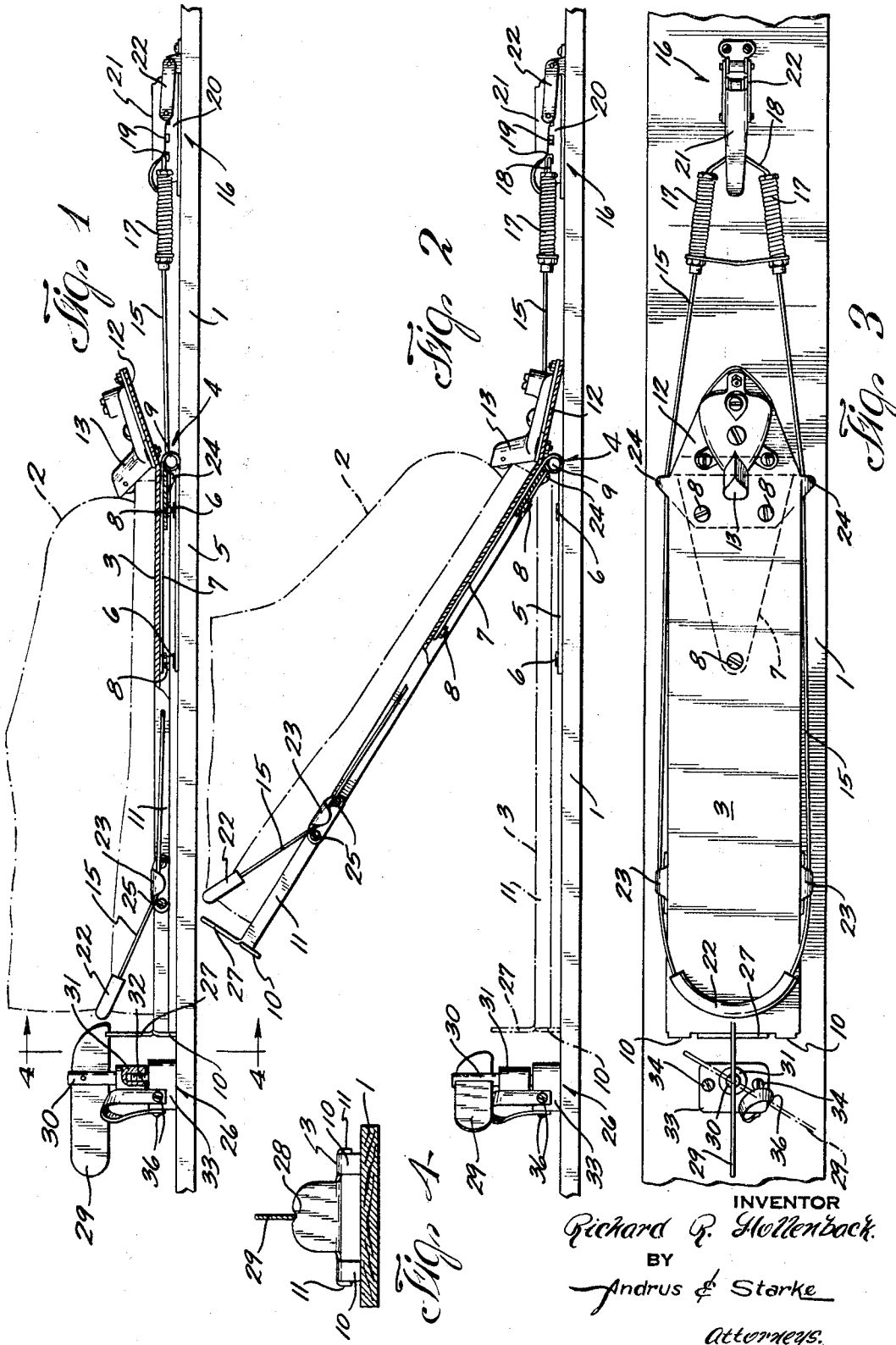
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R. R. HOLLENBACK

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SKI BINDING

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INVENTOR
Richard P. Hollenback.
BY
Andrus & Storke
Attorneys.

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SKI BINDING

Richard R. Hollenback, 1404 Potato Point Road,
Appleton, Wis. 54911

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This invention relates to a safety ski binding for releasable attachment of skis to a ski boot.

Skiing may involve any one of three different varieties which may generally be grouped as downhill or slope skiing, overland or cross-country skiing, and ski jumping or flying. It is highly desirable in all forms to have an attachment of the skis to the skier including a releasable binding such that if the skier should fall with excessive and abnormal strains on the skier's foot, the skis are automatically released and the skier's foot is freed. In slope skiing where high speed turns may be encountered, twisting and breaking of a leg presents a severe problem if the skis are not securely attached to the ski boots such as to respond rapidly while still being released in the event of a fall. Similarly, in ski jumping and the like, release of the skis may become essential.

However, the movement of the foot normally varies with the type of skiing. For example, in ski jumping and in overland or cross-country skiing, the heel of the boot is preferably released to permit raising of the heel from the portion of the ski while retaining interconnection between the front portion and the ski. This is necessary for comfortable maneuvering in overland skiing and essential in ski jumping or flying to permit proper body movement.

In ski jumping and the like, a severe strain is normally placed on the bending of the boot. For the average person, the cost of a pair of ski boots represents a relatively substantial investment. A hinged structure to avoid the adverse stressing is therefore desirable. However, such devices have normally required special boots or modification to the boot which prevents their normal use.

Although special bindings have therefore been suggested for various forms of skiing and highly developed safety release bindings are available, they have certain disadvantages from the standpoint of various forms of skiing, complexity and expense and do not appear to be practical.

The present invention is particularly directed to a highly improved hinged ski binding which permits selective release of the hinge structure for pivotal movement of the usual boot while maintaining normal safety binding in operational connection between the ski and the boot. Generally, in accordance with the present invention, the ski binding includes a boot support member or plate pivotally attached to the ski and including a releasable latch member secured adjacent the back end of the adaptor plate to permit locking of the plate to the ski or releasing of the plate for pivotal movement. The forward end of the adaptor plate is provided with a suitable releasable toe clamp. A releasable binding is secured to the ski and to the boot and is additionally coupled to the plate to move with the plate and maintain the normal safety connection between the ski and boot under all conditions. Thus, usual spring loaded bindings may be releasably secured to the ski immediately forwardly of the plate and project backwardly beneath coupling tabs on the plate and upwardly behind the heel to releasably clamp the boot to the plate. For downhill or slope skiing, the plate is latched against pivotal movement. The safety binding then functions in the normal manner to release the ski from the skier's boot in the event of abnormal stresses on the safety binding. For overland skiing and jumping, the rear latch is released to free the plate for hinged movement. The skier can now pivot forwardly on

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the hinge of the adaptor plate. The interconnection of the safety binding through the adaptor plate to the heel however maintains complete operational action of the safety binding during such forms of skiing.

The latch structure for an adaptor for a hinged ski binding preferably takes the form of an upstanding lip on the back edge of the plate with a plate-like vane set on its edge and rotatably mounted immediately behind the adaptor plate and adapted to be positioned in overlying latching engagement with the lip or spaced from the lip. The vane provides a large operating surface for readily moving of the vane without removal of the skier's gloves. The relatively large leverage will also permit more readily breaking of any lock due to freezing and the like. A looped flat spring is preferably provided to hold the vane in the locked or unlocked position. This provides a relatively simple latch mechanism while permitting ready operation of the device by the skier without the necessity of removing his ski mitts.

The present invention thus provides a relatively simple and reliable safety binding for adapting a single set of skis to the several forms of skiing.

The drawing furnished herewith illustrates a preferred construction of the present invention in which the above advantages and features are clearly disclosed as well as others which will be clear from the following description.

In the drawing:

FIG. 1 is an enlarged side elevational view of a ski binding constructed in accordance with the present invention and attached to a ski with the boot releasably held within the binding;

FIG. 2 is a similar view with the adaptor plate released and showing the hinged movement;

FIG. 3 is a top elevational view of the ski and binding with the boot removed; and

FIG. 4 is an end elevational view more clearly showing a releasable latch lip on the support plate.

Referring to the drawings and particularly to FIG. 1, the ski binding of the present invention is shown applied to a ski 1 for releasable interconnection to a conventional ski boot 2 which is worn in the manner of a shoe. Generally, the ski binding of the present invention includes a metal support plate 3 somewhat longer than the length of the ski boot 2 and narrower than the width of the ski 1, as shown in FIG. 3. The adaptor plate 3 is secured to the ski 1 by a hinge 4 shown as a conventional variety having a first generally triangular plate 5 secured to the ski 1 by a plurality of screws 6 and a second similar plate 7 secured to the forward underside of the adaptor plate 3 by small bolt and nut assemblies 8. The hinge plates have mating cylindrical offset portions interconnected by a hinge pin 9.

In the illustrated embodiment of the invention, the support plate 3 includes depending lips or side edges 10 on the back edge of the plate to support the plate spaced from the ski 1 sufficiently to accommodate the hinge 4. The side edges of the plate 3 also are bent downwardly as at 11 to strengthen the plate.

The forward end 12 of the support plate 3 extends beyond the hinge pin 9 and is bent upwardly at an angle of about 45 degrees.

A conventional toe clamp 13 is bolted or otherwise secured to the bent forward end of the support plate 3 and includes an inclined abutment adapted to receive and overlie the projecting portion 14 of the sole of the boot 1 in the assembled relation shown in the drawing.

A standard releasable loop member 15 which may be formed of a flexible cable or the like has its free ends secured to a releasable latch 16 on the ski 1 forwardly of the hinged connection of plate 3. More particularly, the free ends of the loop member 15 are connected to corresponding similar spring elements 17 which are inter-

connected to a U-shaped yoke member 18 formed of a rod or the like. The yoke member 18 in turn is adapted to be disposed within any one of a plurality of notches 19 in a base member 20 of the latch 16. Member 20 is bolted or otherwise secured to the ski 1 in the usual manner. A binding lever 21 is pivotally secured to the member 20 to overlie the notches 19 and hold the yoke 18 within a set notch. The lever 21 is secured in place by an over center latch linkage 22 to permit insertion and removal of the yoke from a selected notch.

The binding loop member 15 extends along the depending side edge 11 of the plate 3 with the outer end portion extending upwardly and over the back edge of the boot heel as at 22. A pair of tabs or hook members 23 and 24 is secured to each side of the plate 3 in longitudinally spaced relation and defining downwardly opening hooks with the binding loop member 15 extending beneath the hook and then upwardly over the heel portion. Hook members 23 are shown as separate elements attached to the side edges 11 by suitable nut and bolt units 25. Hook members 24 are formed to the opposite ends of a plate-like member which is secured to the underside of the plate immediately adjacent the hinge pin 9 by a pair of the hinge plate attachment nut and bolt units 8.

In the position of FIG. 1, the loop member 15 therefore extends from the releasable connector 16 rearwardly parallel to the ski 1 beneath the rear hook members 23 and 24 and then upwardly around the heel at 22. The plate can pivot about the hinge pin 9 to the position shown in FIG. 2. In this position, the releasable binding loop member 15 expands from the connector generally parallel to the ski 1 to the hinge connection, upwardly alongside of the plate 3 beneath the hook members 23 and 24 and over the protruding edge of the back of the heel. In either position shown, or in any intermediate position, it will be seen that the loop member 15 maintains releasable clamping of the boot to the plate 3 and therefore to the ski 1.

In accordance with the illustrated embodiment of the present invention, a latch mechanism 26 is provided to lock the back end of plate 23 to the ski 1 for slope skiing and the like where the pivotal movement of the boot 2 is undesirable. The illustrated latch mechanism 21 includes an integral upstanding extending latch lip 27 on the rear edge of the plate 3. Tip 27 includes a central notch 28 formed in the uppermost edge thereof. A latching vane 29, in the form of a plate-like member, is pivotally mounted in a vertical plane and is adapted to be disposed in a plane generally parallel to the longitudinal axis of the ski with the forward end disposed within the locking notch 28 to securely lock the plate 3 to the ski 1. It can be rotated to disengage the forward edge from the locking plate and allow the free pivotal movement.

The locking vane is pinned or otherwise fixed within an appropriate slot in pivot shaft 30 which extends downwardly and terminates in a mounting hub 31. The hub 31 includes a bottom tapped hole which threads onto a threaded stud 32 mounted on the ski and forming a part of a mounting base 33 which is secured to ski 1 by a plurality of screws 34. Employing the inner tapped hole which threads onto an upstanding stud 32 reduces the danger of collection of water or moisture which might freeze and interfere with pivoting of the latch vane 29.

A loop spring 35 formed of a strip of spring metal has its opposite ends secured to the base 33 as by screws 36 and extends upwardly to form a loop with the base portion just above the lower edge of vane 29. The loop spring 35 holds the vane 29 in either set position while permitting manual rotation therebetween.

The present invention is thus seen to provide a very versatile safety attachment for interconnecting of a ski boot to a ski while permitting the use of a conventional boot and maintaining the safety binding operational at all

times. Further, the binding provides the necessary efficient interconnection of the boot to the ski for all forms of skiing. For ski jumping and flying, the vane 29 is rotated to the phantom line position of FIG. 3 to release the plate 3 and permit the necessary pivotal movement of the body and foot with respect to the ski 1 without unduly stressing the boot 2 and thus particularly adapting the unit for use by the amateur skier. Similarly, for cross-country skiing and the like, the boot 2 is free to pivot about the pivot pin 9 for comfortable and convenient movement without undue stresses and strain being placed on the boot and foot. However, for slope skiing and the like, the vane 29 is rotated to latch the plate 3 to ski 1 and the boot and foot are held against pivotal movement in accordance with the usual support to maintain proper control of the skis.

The present invention may also be employed with other bindings such as a dual swivel binding rather than the swivel and cable binding shown. In such structure, the rear swivel would be secured to the plate between the heel and plate latch.

In summary, the present invention provides a ski binding which permits ready adaptation to the usual ski and ski boot and binding and in particular maintains the safety bindings operational in all connections and conditions while permitting the desired freedom of movement in accordance with the form of skiing. The latch mechanism is readily operable under the usual conditions encountered in skiing.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A ski binding for releasable connection of a ski to a ski boot, comprising:

a support plate defining a boot supporting surface and having pivot means for pivotal attachment to a ski in the area of the toe of the ski boot, and

a releasable binding member having means coupled to the support member and to the boot to move with the support member and thereby maintain the binding member effective to releasably hold the boot to the support member under all operative positions of the support member,

said boot having a front projecting portion and a rear heel portion adjacent the sole of the boot, and having means secured to the support plate to engage the front projecting portion and having a portion of the binding member engaging the rear heel portion to releasably secure the boot to the support plate,

the support being generally longer than ski boot and including a forward end extending upwardly at an angle,

an abutment secured to the angled end of the plate to overtop the forward end of the sole of a ski boot, and, the pivot means being a hinge means secured to the underside of the plate adjacent the angled end and having securement means for attachment to the ski for pivotally mounting the plate in the foot area of the ski.

2. The ski binding of claim 1 having means to releasably latch the support plate to the ski to prevent pivotal movement of the plate.

3. The ski binding of claim 1 wherein the releasable binding member is a flexible loop member secured to the ski immediately forwardly of the plate and extends rearwardly adjacent the plate and around the heel portion of the boot, and connection members are connected to the support plate and overlie the loop member whereby said binding is effective with the plate engaging the ski or pivoted away from the ski.

4. The ski binding of claim 3 having means to releasably latch the support plate to the ski to prevent pivotal movement of the plate.

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5. The ski binding of claim 1 wherein:
the support plate includes a downwardly extending support lip and an upward latch lip,

the hinge means includes a pair of plates interconnected by a pin, one of said hinge plates being secured to the forward portion of the support plate and the second of the hinge plates being secured to the ski for pivotally mounting the plate in the foot area of the ski,

a releasable flexible binding cable having the opposite ends interconnected to the ski by a releasable latch unit and extending rearwardly to each side of the support with the central portion being adapted to loop around and over the heel portion of the boot,

hook members secured to the support plate and extending over the binding cable to hold the cable to the plate whereby said binding is effective with the plate engaging the ski or pivoted away from the ski, and

a pivotally mounted latch lever secured to the ski immediately behind the support plate and having a first position overlying the upstanding latch lip and a second position spaced from the latch lip.

6. The ski binding of claim 4 having a downwardly

opening spring loop secured to the latch with the upper portion in the path of the latch lever.

7. The ski binding of claim 4 wherein said latch lever is a flat strip-like vane pivoted on a longitudinal edge, and having a pivot support including a stud member secured to the ski and a shaft means secured to the vane and having a tapped opening threaded onto the stud member.

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BENJAMIN HERSH, *Primary Examiner*.

MILTON L. SMITH, *Assistant Examiner*.