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R. F. TIESLER

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REMOVEABLE AND INTERCHANGEABLE SKI BINDING

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2 Sheets-Sheet 2

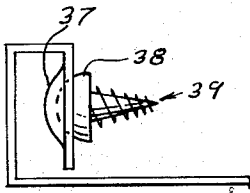


Fig-5

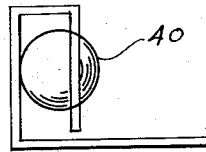


Fig-6

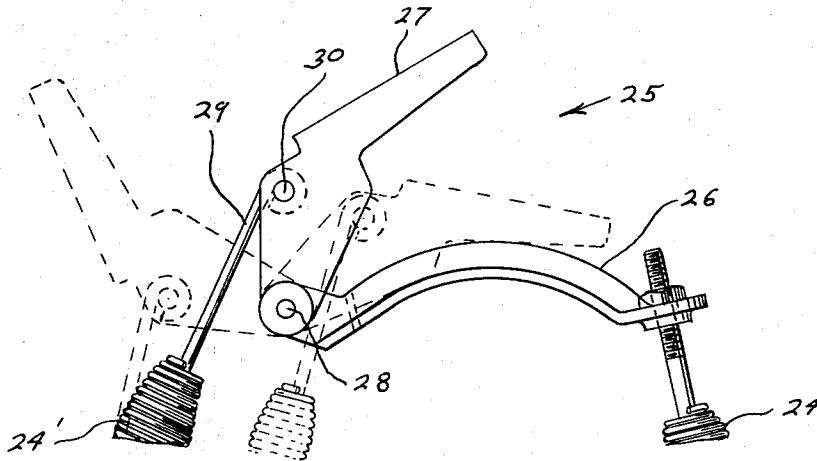


Fig-7

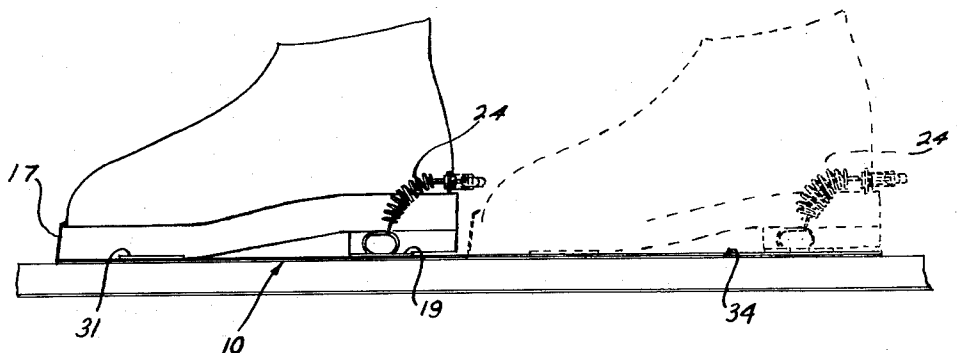


Fig-8

INVENTOR
Robin F. Tiesler
BY
Syrnastovett & Lachner
ATTORNEY

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**REMOVEABLE AND INTERCHANGEABLE
SKI BINDING**

Robin F. Tiesler, 77 W. Court St., Doylestown, Pa.

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8 Claims. (Cl. 280—11.35)

This invention relates to a binding for securing a skier's boot to a ski and more particularly to a ski binding which is adjustable to fit virtually all sizes of skiers' boots and which will permit adjustment of the boot position on the ski to suit various skiing conditions and skiers.

Known prior art ski-bindings generally consist of a boot-toe engaging piece and a separate heel engaging portion, each independently secured to the ski by means of screws or the like. This independent mounting sets up stress in the ski when a binding force is exerted on the boot, thus limiting the use of the lighter, more flexible materials for skis. Due to the permanent nature of the fastening, it is not feasible for the skier to use one binding interchangeably with a plurality of pairs of skis. Moreover, while these bindings have a certain degree of adjustability, fitting the binding for a particular skier is often tedious and time-consuming and requires a skilled fitter for proper adjustment. When many of the bindings now on the market are secured to the skis and adjusted for a particular sized boot, the adjusted setting is not readily changed. In addition, a skier may desire to vary the position of his foot with respect to the ski running surface in accordance with skiing conditions or personal preference which is not possible with bindings now on the market. These shortcomings can become serious problems in the ski rental business for example, where the shop owner must have a wide variety of skis and boot sizes on hand and still must devote a substantial portion of his time to fitting the individual skiers.

Accordingly, it is an object of this invention to provide a simplified ski binding which can be instantly adjustable to any size boot and which can be attached to a ski in a matter of minutes.

It is a further object of this invention to provide a ski binding which permits adjustment of the skier's boot with respect to the center of the running surface of the ski.

It is a still further object of this invention to provide a ski binding whose strength is entirely self-contained, and does not depend upon the ski for exerting a binding force.

A further object is to provide a binding which may be rapidly interchanged with a plurality of skis.

A still further object of the invention is the provision of a ski binding which, when removed from the ski, serves as a boot tree for the skier's boot.

In accordance with this invention, these and other objects are achieved by a ski binding comprising a flanged guide track adapted to be mounted on a ski, an elongated slide plate which is mounted for sliding movement along the guide track, a heel plate mounted for sliding movement lengthwise of the track, means to lock the elongated plate to the guide track, and means to lock the heel plate to the elongated plate.

Additional objects and advantages of this invention will become apparent from the ensuing detailed description and drawings in which:

FIGURE 1 is an elevational view showing a binding constructed in accordance with this invention;

FIGURE 2 is a plan view of the binding of FIGURE 1;

FIGURE 3 is a section taken along lines 3—3 of FIGURE 2;

FIGURE 4 is a section taken along lines 4—4 of FIGURE 2;

FIGURE 5 is a showing of an alternative form of toe-piece for use with the present invention;

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FIGURE 6 is a detail view of second alternative toe-piece formed in accordance with the invention;

FIGURE 7 is a view of a preferred form of heel clamp; and

FIGURE 8 is a view illustrating how the binding is removed from the ski.

In the drawings, FIGURES 1 and 2 show a preferred form of the binding 7 in assembled position on a ski 8 with a boot 9 being diagrammatically shown for illustrative purposes. A guide track 10 is secured to the ski 8 by conventional means such as wood screws 11 counter-sunk in the web of the track as is shown more clearly in FIGURES 3 and 4. In the preferred embodiment of the invention, the guide track is an elongated channel-like member having upwardly and outwardly extending flanges 12. A projection 13 is located intermediate the flanges 12, generally towards the forward end of the channel. While this projection may assume various forms, it preferably takes the form of an extruded pin as shown in the drawings, particularly FIGURES 1 and 3.

Index or center marks 14 may be engraved on the channel member or guide track 10 to aid in properly locating the channel upon the ski. The index marks 14 may also be used by the skier to aid him in locating his foot with respect to the ski running surface. The channel should be placed on the ski so that these index marks coincide with the midpoint of the ski running surface.

An elongated slide plate 16 is fitted to slide on the guide track 10 within the space between the flanges 12. This plate is provided with a generally upright toe-engaging portion 17 on its forward end, which is curved to engage the toe of a skier's boot. If preferred, as shown in FIGURE 5, the toe-engaging piece may be provided with a curved socket 37, adapted to receive a projection such as the head 38 of screw 39, secured to the skier's boot. In the alternative, a ball or roller 40 (FIGURE 6) may be mounted in the toe piece and will fit into a recess provided in the boot toe. The toe piece has sufficient resilience so that excess force caused by a fall will permit the boot to separate from the ski. While the toe-engaging pieces are shown as integral portions thereof of the sliding plate in the drawings, it should be understood that conventional toe-pieces may readily be secured to the sliding plate without departing from the scope of this invention.

The sliding plate 16 is provided with a plurality of apertures 18 extending along the greater portion of its length. These apertures are dimensioned for selective engagement with the projection 13, in order to properly position the toe piece on the ski.

Heel slide 19 comprises a plate having inwardly extending flanges 20 (FIGURE 4). The plate or slide 19 is adapted for sliding movement along the flanges of the guide track 10, the flanges 20 engaging the underside of the flanges 12 so that the heel plate is held against vertical movement while on the track.

A locking means shown in the form of downwardly extending projection such as extruded pin 21 is provided in the center of the plate 19 for selective engagement with the apertures 18 in the elongated slide plate 16. The heel plate or slide 19 is dimensioned so that when the pin is engaged with an aperture 18 and the flanges 20 are engaged with the flanges 12, the heel slide is locked with respect to plate 16 and toe-piece 17 but is free to move with these elements along the track 10.

The heel slide 19 is provided with a pair of D-rings 22 mounted for example on each side of the plate in bent-over flanges 23. Resiliently connected to the D-rings, by means such as springs 24 and 24', is a heel-engaging toggle mechanism 25 including a plate 26 shaped to engage the back of the heel of the skier's boot (FIG-

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URE 7). As shown in FIGURE 7, one side of the heel plate 26 is secured to spring 24. A toggle locking lever 27 is pivotally mounted on plate 26 by means of pins 28, one of which is shown in FIGURE 7. Spring 24' is connected to the toggle-locking lever 27 by means such as a connecting link 29 secured to the spring and pivotally connected to the lever by a pin 30. The parts are arranged so that when the lever 27 is pivoted toward the heel engaging plate, the heel plate 26 clamps the boot in place. Due to the toggle arrangement, accidental dislodgement of the heel plate is prevented when lever 27 is moved to locking position. While I have illustrated a preferred form of heel clamp, other conventional heel clamping means could be mounted on the heel slide without departing from the scope of this invention.

A locking plate 31, having flanges 32, is formed for sliding movement along the guide track 10. The plate may be provided with a slight dimple 33 which engages pin 13 or the apertures 18 to prevent accidental movement thereof once it is set in position. When the locking plate is positioned over an aperture 18 which has been placed in registry with the projection 13, the elongated slide or plate 16 is locked against movement.

In use, the heel plate 19 including the heel gripping assembly of FIGURE 7, is first moved along the slide plate 16 until the heel plate is adjusted in accordance with the proper boot size. The boot may then be secured between the toe-piece 17 and the heel gripping means 25. The assembly including the toe piece 17, elongated slide 16, locking plate 31 and heel gripping means 25 is then fitted on to the guide track which was previously secured to the ski. Using center line 14 is a guide, the assembly is then moved with respect to the guide track to suit the skier's preference and/or the skiing conditions. The aperture opposite projection 13 is brought into registry therewith and the lock plate 31 is then moved over this aperture completing the adjustment of the binding.

In conjunction with a second channel plate, the binding assembly provides the skier with a simple and efficient boot tree. In order to use the binding as a boot tree, the skier merely moves the locking plate 31 rearwardly out of engagement with the projection 13 and lifts slide 16 to disengage aperture 18 from the projection. The assembly is then free to be moved rearwardly off the ski and on to the auxiliary boot tree plate 34. The boots may then be stored on the binding until further reuse, or the skier may instantly switch the boots with the attached binders to another pair of skis previously equipped with a guide track 10.

From the foregoing description, it may be seen that the present invention provides a binding which is extremely simple and yet is adjustable for all skiing conditions and all types and sizes of skiers. The binding is a unitary structure and depends on its own inherent strength for holding the skier's boot, and thus can be used on light-weight and flexible skis. The binding may be interchangeably used with any ski fitted with a guide track and is instantly adjustable without tools. Moreover, it may be used in conjunction with heel and toe portions of conventional non-adjustable bindings to provide for ready adjustability as described herein.

I claim:

1. A ski binding for a skier's boot comprising:
 - an elongated plate;
 - a boot heel engaging device having means providing for relative adjustment and mounting thereof in different positions lengthwise of said plate;
 - and a track adapted to be mounted on a ski;
 - the plate and track having cooperating means providing for mounting of the plate on the track alternatively in different positions lengthwise of the ski;
 - said cooperating mounting means also being separable to provide for lengthwise movement of the plate with the boot mounted thereon, off said track and

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thus for alternative cooperation of the plate with another track independent of said first track.

2. A ski binding for holding a skier's boot on a ski comprising:

- a guide track adapted to be mounted on a ski, said guide track comprising a channel member having outwardly extending flanges spaced from the upper surface of the ski, and having an upwardly extending projection spaced intermediate said flanges,
- an elongated plate mounted for sliding movement along said channel member within the space between said flanges,

- a heel plate mounted for sliding movement lengthwise of said track,

- means to lock said heel plate to said elongated plate including a downwardly extending projection on said heel plate and a series of spaced apertures in said elongated plate, said projection being selectively engageable with said apertures to prevent relative movement between said heel plate and said elongated plate, and

- means for locking said elongated plate to said guide track, said locking means including a lock plate slidably mounted on said channel member,

- said lock plate having downwardly and generally inwardly extending flanges slidably engaging the underside of said channel flanges, said lock plate being movable over the upwardly extending projection on said channel member when said projection is in registry with a selected aperture in said elongated plate, thereby maintaining said elongated plate in adjusted position.

3. A binding for securing a skier's boot to a ski comprising:

- a guide track adapted to be mounted on a ski,
- said guide track comprising a channel member having outwardly extending flanges spaced from the upper surface of the ski;

- an elongated plate mounted for sliding movement along said channel member within the space between said flanges;

- locking means for locking said elongated plate with respect to said track including a lock plate slidably mounted on said track, said lock plate having downwardly and generally inwardly extending flanges slidably engaging the underside of said channel flanges;
- a heel plate mounted for sliding movement lengthwise of said track;

- means to lock said heel plate to said elongated plate;
- said heel plate being slidably mounted on said track and having downwardly and generally inwardly extending flanges slidably engaging the underside of said channel flanges.

4. A binding for securing a skier's boot to a ski comprising:

- a guide track adapted to be mounted on a ski, said guide track comprising a channel member having laterally extending flanges spaced from the upper surface of the ski;

- an elongated slide plate mounted for sliding movement along said channel member within the space between said flanges to different adjusted positions lengthwise of the ski;

- a heel plate slideably mounted on said track, said heel plate having flange engaging portions shaped to prevent separation of the heel plate from the track;

- means for locking said heel plate to said elongated slide plate in different adjusted positions lengthwise thereof; and

- means for locking said elongated slide plate to said guide track including a lock plate slideably mounted on said channel member, said lock plate having flange engaging portions shaped to prevent separation of the lock plate from the guide track.

5. A ski binding according to claim 4, wherein said

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heel plate locking means includes a downwardly extending projection on said heel plate, said projection being engageable with selected apertures on said elongated member.

6. A ski binding for holding a skier's boot on a ski, 5 comprising:

a guide track adapted to be mounted on the ski, said guide track comprising a channel member having laterally extending flanges spaced above the surface of the ski; 10

a heel plate slideably mounted on said channel member, said heel plate having flange engaging portions shaped to prevent separation of the heel plate from the channel flanges;

a locking plate and an elongated plate each slideably 15 mounted on said track;

said locking plate having flange engaging portions shaped to prevent separation of the lock plate from the channel member;

said elongated slide plate being mounted within the 20 space between said flanges and having a series of locking apertures spaced therealong; and

means including said locking plate and a projection engageable with selected ones of said apertures for locking said elongated plate to said channel member 25 in adjusted positions lengthwise thereof.

7. A ski binding for holding a skier's boot on a ski comprising:

a guide track member adapted to be mounted on a ski; an elongated slide plate member mounted for sliding 30 movement on said track to different adjusted positions lengthwise of the ski;

a heel plate slidably mounted on said track;

means for locking said heel plate in different adjusted 35 positions lengthwise of said slide plate for conjoint movement therewith along said guide track;

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means for locking said slide plate to said track in selected adjusted position lengthwise of the ski;

said guide track comprising a channel member having outwardly extending flanges spaced from the upper surface of the ski;

said elongated plate member being mounted for sliding movement along said channel member within the space between said flanges;

a series of spaced apertures in one of said members and a projection on the other of said members extendable into selected ones of said apertures for locking said members in adjusted position; and

said heel plate being slidably mounted on said channel member and having downwardly and generally inwardly extending flanges slidably engaging the underside of said channel flanges.

8. A ski binding according to claim 7, wherein the locking means for said heel plate includes a series of spaced apertures on said elongated slide plate member and a projection extendable into a selected one of said apertures.

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BENJAMIN HERSH, *Primary Examiner.*