

June 27, 1967

G. KLAMT

3,328,044

SKI RELEASE BINDING

Filed June 30, 1964

4 Sheets-Sheet 1

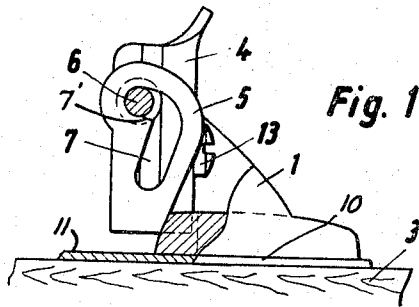


Fig. 1

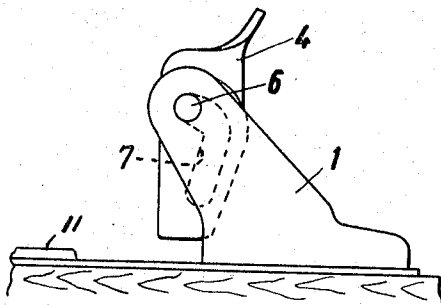


Fig. 2

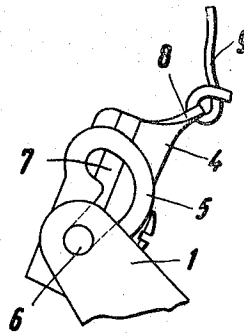


Fig. 3

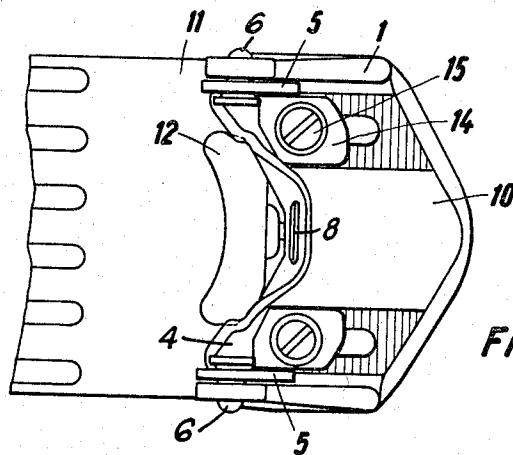


Fig. 4

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4 Sheets-Sheet 2

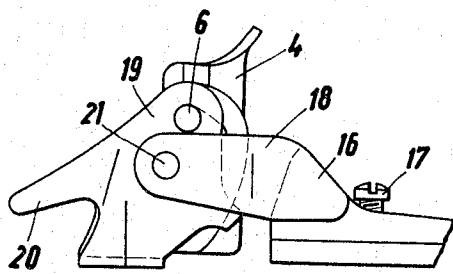


Fig. 5

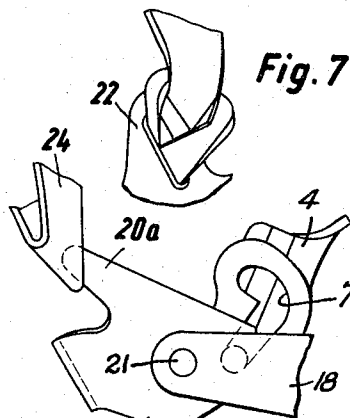


Fig. 7

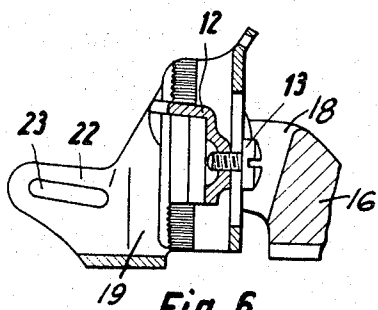


Fig. 6

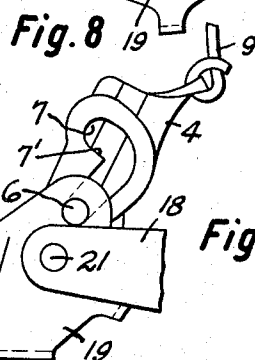


Fig. 8

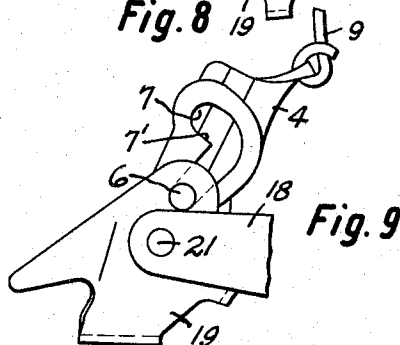


Fig. 9

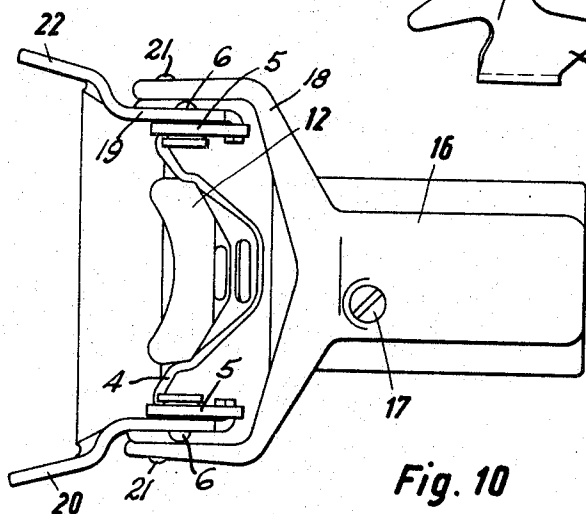


Fig. 10

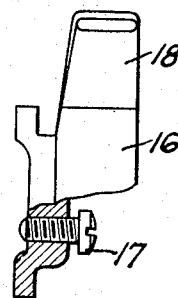


Fig. 11

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SKI RELEASE BINDING

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4 Sheets-Sheet 4

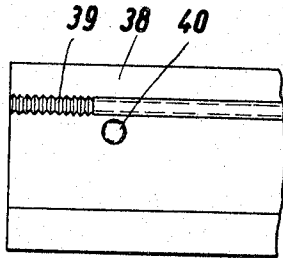


Fig. 15

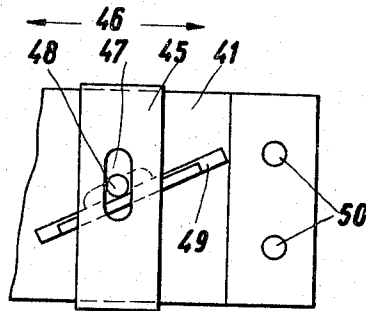


Fig. 16

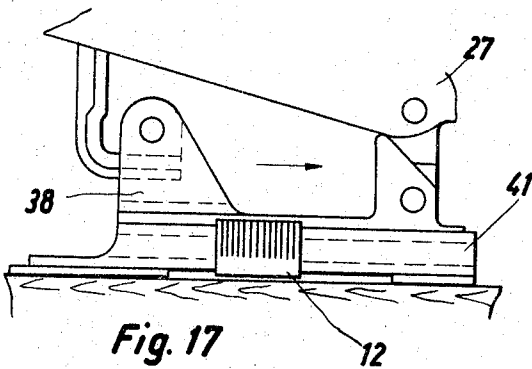


Fig. 17

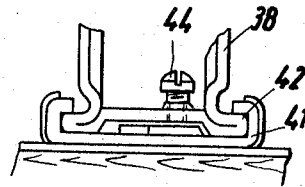


Fig. 18

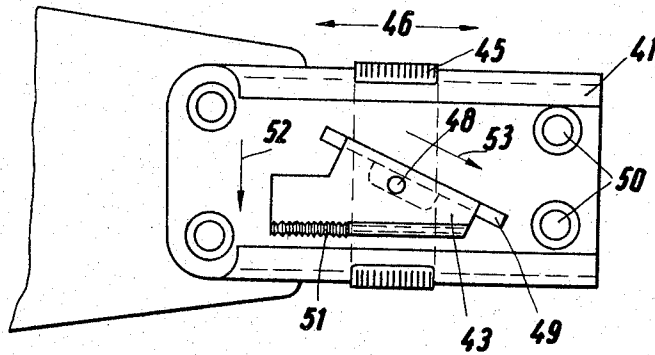


Fig. 19

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3,328,044

SKI RELEASE BINDING

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Claims priority, application Germany, July 2, 1963,
K 50,109; Apr. 7, 1964, K 4,730, K 50,109, K 52,589

18 Claims. (Cl. 280—11.35)

The present invention relates to a ski release binding which is provided with a heel securing device which is adapted to release the ski boot if excessive forces occur which act vertical to the upper surface of the ski.

This release binding is used in combination with a toe binding of known art, which in stretched condition presses the boot against the heel securing device. For this purpose the toe binding contains a pressure spring. Only if excessive forces occur this toe binding permits the boot to be forced forwardly. Such a toe binding is for example described in U.S. Patent 2,616,714. However the invention shall not be restricted to be used with a toe binding of the kind illustrated in this U.S. Patent.

The ski release bindings which are presently known are usually of the type which release the ski boot when torsional stresses occur and which are therefore intended to prevent torsional bone fractures. These bindings are, however, usually incapable of releasing the boot when excessive forces occur which act upon the booted foot of the skier in a vertical direction to the upper surface of the ski. Such excessive forces occur particularly when a skier falls forwardly or toward the rear.

It is, therefore, an object of the present invention to provide a ski release binding, the heel securing device of which is designed so as to release the booted foot of a skier when excessive forces occur which act substantially vertically to the upper surface of the ski.

One feature of the invention for attaining this object consists in the provision of a heel securing device which essentially consists of a mounting member which is secured to the ski, and a heel-securing member which is supported by this mounting member so that it can move longitudinally of the ski between latching and releasing positions. In its latching position, the heel-securing member is disposed for fastening engagement with the heel of the boot, and is held in this position by releasable catch means that connect it with at least a portion of the mounting member, so that it is held in its heel-securing position by the rearward pressure of the boot against it. The catch means are provided with a releasing arrangement which moves the heel-securing member and boot forward when an excessive force is exerted by the boot on the heel-securing member in a direction substantially perpendicular to and away from the upper surface of the ski. Such forward movement of the heel-securing member causes it to unlatch and to release the boot.

The catch means may consist, for example, of angularly shaped guide slots in the heel-securing member, through each of which extends a pivot pin on the mounting member, such that the heel-securing member can both pivot about an axis disposed at right angles to the ski and also slide within the limits of the guide slots. One leg of each guide slot is inclined rearwardly toward the ski, while a second leg extends downward toward the ski from the rearmost end of the first leg. When the heel-securing member is pivoted forward and down so that the pivot pins on the mounting member are aligned with the first leg of the guide slots, rearward movement of the heel-securing member under the urge of the heel of the boot causes the pivot pins to engage within the inclined leg of each guide slot. This latches the heel-securing member in position so that the heel of the boot is clamped to the ski.

If an excessive force is exerted upward (i.e. perpendicular to and away from the upper surface of the ski) by the boot on the heel-securing member, as for example when the skier takes a bad fall forward, the lower edge of the first leg of the guide slot acts as a wedging surface on the pivot, forcing the heel-securing member forward, thereby moving the guide slots so that the pins become aligned with the second leg of each guide slot. The heel-securing member is then free to move upward, which in turn permits it to tilt backward and release the heel of the boot.

Another feature of the invention consists in the provision of suitable means for also securing the heel of the ski boot from above. These means consist of a holding bracket which is inserted into the central part of the heel-securing member and is adapted to engage upon the upper edge of the boot heel. Since the ski binding should be adjustable to permit different kinds of ski boots to be properly secured to a pair of skis and since the heels of different ski boots may vary considerably in height, the invention further provides this holding bracket to be adjustable to different elevations relative to the upper surface of the ski.

The heel-securing member of the ski binding should also serve as a means for securing a run-away strap thereon. For this purpose, the upper edge of the central part of the heel-securing member may be bent toward the rear and preferably provided with an eye through which such a strap may be passed.

Another feature of a ski binding according to a modification of the invention consists in mounting the heel-securing member into which the heel of the ski boot is inserted so as to be pivotable within a substantially U-shaped intermediate member which forms a part of the mounting member is pivotably mounted between two parallel arms forming another part of the mounting member.

By the provision of this intermediate member it is possible to employ the heel securing means of the present invention in combination with longitudinal straps. The intermediate member is for this purpose provided on its two front ends with tabs, one of which is provided with an eye for inserting one end of a longitudinal strap, while the other end of the strap is adapted to be hooked over a downwardly projecting hook on the other front end of the intermediate member. The intermediate member is preferably mounted so that the axis of the pivot pins of the yoke is located above and toward the rear of the axis about which this member is pivotable on the arms of the mounting member.

The last-mentioned embodiment of the invention may be further modified by mounting the part, to which the U-shaped intermediate member is pivoted, on the free ends of two pivotable swing arms which are adapted to be released from a lower locked position for down-hill runs so as to permit the heel of the boot to swing freely for a limited distance off the surface of the ski for cross-country runs. These swing arms are preferably pivotable on a pair of link members, the shorter one of which is connected to the rear end of these arms, while the larger link member is connected to the arms at a point intermediate the opposite ends thereof. These link members are, in turn, pivotably connected to a support which is secured to the ski.

The last-mentioned combination therefore permits the same ski binding to be used as a release binding for down-hill runs and also as a touring binding for cross-country runs, and it is adapted to be very easily and quickly adjusted for use for one purpose or the other.

The most simple device for locking the swing arms in the position for down-hill skiing consists of a pawl arrangement. This pawl must first be disengaged from

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its associated locking recess before the ski binding can be changed over from its position for a down-hill run to that for a cross-country run. Such a simple pawl arrangement has, however, the disadvantage that there is a danger that during a cross-country run the pawl may become accidentally locked so that the ski binding will again be rigidly connected to the ski.

An improved device for locking and releasing the swing arms on which the heel-securing device is pivotably mounted consists according to the invention of a locking lever which is movable in the space between and parallel to the two swing arms and is pivotable at one end about the same axis on which the longer forward connecting link of the swing arms is pivotably mounted on the fixed support on the ski, while the free end of this lever may swing in the direction toward the axis of the rear connecting link and when in the closed or locked position it will rest on the transverse connecting parts between the swing arms.

The manipulation of such a ski binding is extremely simple. In order to release the heel securing device from its locked position on the ski so that the ski binding will be ready for a cross-country run, it is merely necessary to lift the mentioned locking lever and to pivot it to a substantially vertical position. If the ski binding is thereafter again to be locked in the position for a down-hill run, it is merely necessary to press the locking lever downwardly which thereby carries out the locking operation automatically.

The above-mentioned and still further features and advantages of the present invention will become more clearly apparent from the following detailed description thereof which is to be read with reference to the accompanying drawings, in which:

FIGURE 1 shows, partly in section, a side view of a heel binding for skis according to the invention from which the front part of the mounting member is removed;

FIGURE 2 shows a side view of the complete heel binding shown in FIGURE 1;

FIGURE 3 shows the heel binding of FIGURES 1 and 2 in the released position;

FIGURE 4 shows a top view thereof;

FIGURE 5 shows a side view of a modified heel binding according to the invention;

FIGURE 6 shows a longitudinal section of the device according to FIGURE 5;

FIGURE 7 illustrates the manner of connecting a longitudinal holding strap to the heel securing device according to FIGURES 5 and 6;

FIGURE 8 illustrates the manner in which the holding strap is released when the heel binding releases;

FIGURE 9 shows a side view of the heel binding in the released position when no longitudinal strap is employed;

FIGURE 10 shows a top view of the heel binding according to FIGURES 5 to 9;

FIGURE 11 shows a partial cross section of the housing or mounting member taken at a line passing through the connecting screw as shown in FIGURE 10;

FIGURE 12 shows a longitudinal section of another modification of the invention in which the heel binding may be changed over from a position for down-hill skiing as illustrated to a position for cross-country skiing;

FIGURE 13 shows a side view of the heel binding according to FIGURE 12 in the position for cross-country skiing;

FIGURE 14 shows a top view of the heel binding according to FIGURES 12 and 13;

FIGURE 15 shows a bottom view of a part of the means for removably securing the binding according to FIGURES 12 to 14 to a ski;

FIGURE 16 shows a bottom view of a slide arrangement for a removable heel binding;

FIGURE 17 shows a side view of a removable support for the heel binding;

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FIGURE 18 shows an end view of the removable support; while

FIGURE 19 shows a top view of the removable support and the slide arrangement according to FIGURES 15 to 18.

As illustrated in FIGURES 1 to 4, the heel binding according to the invention comprises a housing or mounting member 1 which is mounted on a plate 2 on the upper surface of a ski 3, and a yoke-shaped heel-securing member 4 which is pivotably mounted on pivot pins 6 on the housing 1 and has two lateral tabs 5 thereon which extend parallel to each other. These tabs 5 are provided with angular slots 7 in which the pivot pins 6 are guided and slidable from one end to the other. The central part of the yoke 4 has an eye 8 for holding a run-away strap 9.

FIGURE 4 further shows a serrated friction plate 10 upon which the housing 1 is screwed by means of the screws 15 which press the tabs 14 of the housing upon this plate 10, 11 indicates the usual heel supporting plate. The angular heel holding bracket 12, as also shown in FIGURE 4, is mounted within the yoke 4 and is adjustable to different elevations and adapted to be locked in the adjusted positions by a screw 13 (FIG. 1). Yoke 4 is desirably a sheet-metal part shaped substantially to fit the contour of the rear heel-portion of the ski boot.

As may be seen in FIG. 1, the shorter legs of the angular slots 7 are inclined downwardly and to the rear of the ski, so that the lower edge 7' of this leg of each slot forms a wedging surface, with which the pin 6 engages when the yoke 4 is latched. Consequently, an excessive force exerted by the boot upward away from the ski causes the wedging surface 7' to press upward on the pin 6, and to shift yoke 4 forward against the boot, which also moves forward due to the resilient means provided in the toe binding.

Forward shifting of the yoke 4, moves the slots 7 so that pins 6 are aligned with the other leg of each slot, thus permitting the yoke to move upward. In FIG. 3 it may be seen that, when the yoke 4 is released at the occurrence of excessive vertical forces, it will tilt toward the rear so that the heel of the ski boot will be released from the heel bracket 12.

FIGURES 5 to 11 illustrate a modification of the invention in which the heel binding comprises a U-shaped bracket 19 which is inserted between and pivotably mounted on pivot pins 21 on the two arms 18 of the housing 16. The axis of the pivot pins 6 on which the yoke 4 is mounted extends above the axis of pivot pins 21 and slightly toward the rear thereof. Bracket 19 is provided on its two ends with extensions 20 and 22. The extension 20 forms a hook 20a, while the extension 22 is provided with a slot 23 into which a longitudinal strap 24 may be inserted and secured in the manner as shown in FIGURE 7. When the ski boot is secured to the ski binding, the free end of this longitudinal strap 24 is hooked into the hook 20a.

The release of the yoke 4 according to FIGURES 5 to 11 occurs in the same manner as in the first embodiment of the invention according to FIGURES 1 to 4. However, simultaneously with the release of yoke 4, the bracket 19 also tilts upwardly, as illustrated in FIGURE 8, so that the longitudinal strap 24 can slip out of the hook 20a. FIGURE 9 shows the manner in which the yoke 4 is released if no longitudinal strap is employed for securing the boot. FIGURE 10 shows a plan view of this safety binding as seen from above, while FIGURE 11 shows a partial cross section thereof which is taken transversely of the screw 17 by means of which the housing part 16 is secured on a slide which is mounted on the ski.

FIGURES 12 to 14 illustrate a further modification of the invention in which the ski binding is adapted to be changed from a position suitable for down-hill skiing to a position for cross-country skiing. Those parts of this embodiment which are substantially the same as in the embodiments according to FIGURES 1 to 4 and 5 to 11 are also indicated by the same reference numerals.

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As shown in the side view according to FIGURE 13, the yoke is pivotably mounted in a U-shaped bracket 19, and the lateral parts of yoke 4 are provided with angular slots of the same shape as shown in FIGURES 1 and 3. Bracket 19, in turn, is mounted on the ends of a pair of arms 27 so as to be pivotable about the axis of pivot pins 21. These arms 27 are rigidly connected to each other by transverse parts 36 and are pivotally connected by links 31 and 28 to two pivot pins 30 and 29 on the housing, and these links 31 and 28 are, in turn, pivotally connected by pivot pins 32 and 33 to the arms 27.

When the arms 27 are in the locked position, as illustrated in FIGURE 12, they are pivoted downwardly. The heel securing bracket 19 is then in a fixed position relative to the upper surface of the ski and is locked in this position by a locking lever 34 of an angular shape which is pivotable within an angle of 90° about the pivot pin 30. FIGURE 13 illustrates lever 34 in its opened position in which the two arms 27 are released and can therefore move upwardly and downwardly in accordance with the movements of the heel of the ski boot as required in a cross-country or touring run.

In order to change the ski binding for a down-hill run, the arms 27 are pressed downwardly and at the same time the locking lever 34 is swung in the clockwise direction to the position as shown in FIGURE 12. The locking lever 34 then engages upon the transverse parts 36 which connect the two arms 27 to each other and it thereby prevents the arms 27 from pivoting upwardly.

If one of the transverse connecting parts 36 of the arms 27 is provided with a locking projection 36a and the locking lever 34 with a corresponding recess 35, these two parts will engage with each other and thereby prevent the lever 34 from pivoting upwardly accidentally. When the locking lever 34 is pivoted upwardly from the position as shown in FIGURE 12, these two parts must first be disengaged from each other before the locking lever can be swung to the position as illustrated in FIGURE 13.

As further shown in FIGURES 12 and 13, the free end of the locking lever 34 is provided with a covering 37 of a soft material, for example, rubber, to serve as a shock absorber so as to reduce considerably the noise occurring during a cross-country run as the result of the up-and-down movements of the arms 27.

For securing the ski binding according to the invention to the ski in a manner so as to permit it to be easily exchanged, it is advisable to employ the following means, as illustrated in FIGURES 15 to 19, in which FIGURE 15 shows a bottom view of a part of a heel securing device; FIGURE 16 shows a bottom view of a slide support which is to be secured to the ski; FIGURE 17 shows a side view of a part of the heel securing device which is inserted into the slide support which is secured to the ski; FIGURE 18 shows a front view of the parts according to FIGURE 17; while FIGURE 19 shows a top view of the slide support in the position in which it is to be screwed upon a ski.

While in FIGURE 15 the lateral flanges of the mounting member 38 of the binding can only be seen from below, they are better visible in the front view according to FIGURE 18. One inner longitudinal edge of the centrally recessed lower part of the housing is provided with serrations 39, while the recessed part itself contains a tapped bore 40 into which a locking screw 44 is screwed from above as shown in FIGURE 18.

FIGURE 16 shows that the central part of the slide support 41 is provided with an elongated slot 49 which extends obliquely to the longitudinal edges of the support, and receives the bent-over edge of an adjusting member 43 which by means of a pin 48 is connected to a slide member 45 which has a slot 47 therein in which the pin 48 is movable in the vertical direction during the reciprocating movement of the slide member 45 in the direction of the arrows 46.

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FIGURE 19 shows the slide member and slide support as seen from above and in a position in which the slide support 41 is secured to the upper surface of a ski by means of screws which are inserted into the screw holes 50. FIGURE 19 also shows the shape of the adjusting member 43 which is provided along its longitudinal edge extending parallel to the longitudinal edges of the slide support with serrations 51 corresponding to the serrations 39. The two sets of serrations 39 and 51 are only partly shown as such in FIGURE 19, while the remainder is only indicated in dotted lines.

For securing the mounting member 38 in a fixed position within the slide support 41, the flanges 42 of member 38 are inserted into the slide support 41 after the adjusting member 43 has been shifted by its outer gripping parts toward the left. When the housing of the mounting member 38 is located in the proper position, the adjusting member 43 is shifted by its handle parts toward the right until the serrations 51 engage with the serrations 39 and the slide member 45 is thus securely locked in a fixed position. Thereafter it is only necessary to tighten the screw 44 in the housing 38, so as to lock the adjusting member 43 to the housing.

It is therefore evident that these securing means are of a very simple construction and have the important advantage that the ski binding can be easily adjusted at any time to the particular ski boots which may be worn by the skier and without requiring any tools for such adjustment.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. In a release binding for skis including a toe binding for securing the toe of a ski boot to a ski, wherein said toe binding includes means for resiliently urging the boot rearwardly on the ski, a heel binding for releasably securing the heel of the ski boot to the ski comprising in combination:

(a) a mounting member adapted to be rigidly secured to the ski,

(b) a heel-securing member having a heel-holding portion engageable with the heel of the boot for securing the same to the ski perpendicularly thereof, said heel-securing member being supported by said mounting member for movement with respect thereto between a rearward latching position and a forward releasing position relative to said ski, said holding portion being disposed in heel-securing relation with the heel of the boot when said heel-securing member is in said rearward position, and

(c) catch means interposed between said heel-securing and mounting members for fastening said heel-holding portion in heel-securing relation with the heel of the boot when said heel-securing member is in said rearward latching position, and having a wedgelike surface for moving said heel-securing member forward in order to release said catch means when an excessive force is exerted on said heel-holding portion substantially perpendicular to and away from the ski.

2. A release binding for securing the heel of a ski boot to a ski comprising in combination:

(a) a mounting member adapted to be rigidly secured to the ski,

(b) a heel-securing member having a heel-holding portion engageable with the heel of the boot for securing the same to the ski perpendicularly thereof, said heel-securing member being supported by said mounting member for movement with respect thereto between a rearward latching position and a for-

ward releasing position relative to said ski, said holding portion being disposed in heel-securing relation with the heel of the boot when said heel-securing member is in said rearward position, and

(c) catch means interposed between said heel-securing and mounting members for fastening said heel-holding portion in heel-securing relation with the heel of the boot when said heel-securing member is in said rearward latching position, and having a wedge-like surface for moving said heel-securing member forward in order to release said catch means when an excessive force is exerted on said heel-holding portion substantially perpendicular to and away from the ski.

3. A heel-release binding for skis as defined in claim 2, wherein said wedge-like surface is disposed on one of said mounting and heel-securing members and is inclined with respect to the upper surface of the ski and an engagement surface is disposed on the other of said members for engagement with said wedge-like surface when said heel-securing member is moved rearwardly into latching position.

4. A heel-releasing binding for skis as defined in claim 2, wherein said catch means include pivot means fixed to a portion of said mounting member together with guide slots in said heel-securing member through which said pivot means extend, said heel-securing member comprising a yokelike member having opposite lateral sides in which said guide slots are formed, said pivot means having an axis extending parallel to the upper surface of the ski and at right angles to the longitudinal direction of the ski, said heel-securing member being pivotable about said axis and also adapted to be shifted relative to said heel-securing member within the extent of said guide slots; said guide slots being of identical angular configuration, each having a first leg inclined to the upper surface of the ski and a second leg extending from the rear extremity of said first leg toward the ski, one edge of said first leg forming said wedge-like surface and said pivot means engaging said wedge-like surface when said heel-securing member is in its latching position such that excessive pressure between said wedge-like surface and pivot means forces said heel-securing member forwardly, causing said pivot means to be disposed within said second leg of each guide slot so that said heel-securing member is free to move away from the upper surface of the ski in order to release the heel of the boot.

5. A ski release binding as defined in claim 4, in which said yokelike member consists of a sheet metal part having a shape substantially in accordance with the contour of said heel and having lateral extensions thereon, bent back so as to extend parallel to each other and each containing one of said angular guide slots.

6. A ski release binding as defined in claim 4, wherein said heel-holding portion comprises an angular member within the central part of said yokelike member adapted to engage from above and upon the upper edge of said heel when said yokelike member is in said rearward latching position, and adjusting means for securing said angular member at different elevations on said yokelike member in accordance with different thicknesses of the heels of different ski boots.

7. A ski release binding as defined in claim 4, in which the upper end of the central part of said yokelike member is bent toward the rear and forms an eye through which a run-away strap may be inserted.

8. A ski release binding as defined in claim 4, in which said mounting means comprises a pair of substantially parallel arms, and further comprising a substantially U-shaped intermediate member between said arms, said pivot means for said yokelike member being secured to said intermediate member, and means for pivotably connecting said intermediate member to the front ends of said arms so as to be pivotable about an axis extending parallel to said axis of said first pivot means.

9. A ski release binding as defined in claim 8, in which

said U-shaped intermediate member has a pair of lateral forward projections at both sides thereof, one of said projections having an aperture for inserting one end of a longitudinal holding strap therein, and the other projection forming a hook extending obliquely downwardly when said yokelike member and said intermediate member are in said normal position, the other end of said longitudinal strap adapted to be attached to said hook in said latching position and to slide off said hook when said yokelike and intermediate members are pivoted toward the rear from said latching position.

10. A ski release binding as defined in claim 8, in which the axis of said first pivot means for said yokelike member is located above and toward the rear of the axis of said pivot means for said intermediate member.

11. A ski release binding as defined in claim 4, in which said mounting member comprises a support adapted to be rigidly secured to the ski and a pair of substantially parallel arms, shorter link means pivotably connected to the rear ends of said parallel arms and of said support, and longer link means pivotably connected to said support near the front end thereof and to said arms at a point intermediate their opposite ends, said link means permitting said arms to swing about their rear axes from a lower position substantially parallel to the upper surface of the ski for a limited distance in the upward direction, and means for locking said arms in said lower position for downhill skiing and for releasing said arms to swing upwardly and downwardly for cross-country skiing.

12. A ski release binding as defined in claim 11, further comprising at least one transverse member rigidly connecting said arms to each other, said locking means comprising a locking lever pivotably connected at one end to said support near the front end thereof and pivotable within the space between said arms about the axis of said longer link means on said support from its open position in which it extends in an upward direction to its closed position toward the rear in which it rests upon said transverse connecting member.

13. A ski release binding as defined in claim 12, in which said transverse connecting member has a projection thereon and said locking lever has a corresponding recess, said projection engaging into said recess when said lever is in its closed position so as to prevent said lever from accidentally pivoting out of said closed position.

14. A ski release binding as defined in claim 12, further comprising cushioning means on the free end of said locking lever.

15. A ski release binding as defined in claim 2, further comprising means for removably securing said mounting member to said ski, said means comprising a slide support having a bottom rigidly secured to said ski and guide flanges at both sides of said bottom, said mounting member having a bottom and corresponding flanges at both sides of said bottom and adapted to be inserted between and slidable along said guide flanges, the part of said mounting member bottom between said flanges thereon being raised so as to form a hollow space between said two bottoms, one of said flanges having a series of serrations on the inner side thereof facing said hollow space and extending in the longitudinal direction of the ski, said bottom of said slide support having a slot therein extending obliquely to said longitudinal direction, a flat adjusting member within said hollow space and having a series of serrations on one longitudinal edge thereof adapted to engage with said first serrations and further having a downwardly projecting part thereon engaging into and slidable along said oblique slot for engaging said serrations with each other, and disengaging them from each other, and means for locking said adjusting member to said mounting member when said serrations are in engagement with each other.

16. A ski release binding as defined in claim 15, further comprising means for securing the bottom of said slide support near both ends thereof to said ski, said bot-

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tom having a recess in its lower side in a part intermediate said securing means and an aperture in said bottom part above said recess, and a slide member connected through said aperture to said adjusting member and extending through said recess to the outside and having at least one outer end serving as a grip for adjusting said adjusting member. 5

17. A ski release binding as defined in claim 16, in which said slide member extends transversely through said recess and its ends are bent upwardly and around the lateral edges of said slide support and having surfaces thereon suitable for firmly gripping said slide member. 10

18. A ski release binding as defined in claim 15, in which said locking means for said adjusting member consists of a single setscrew in the bottom of said mounting 15

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member adapted to press said adjusting member upon the bottom of said slide support.

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