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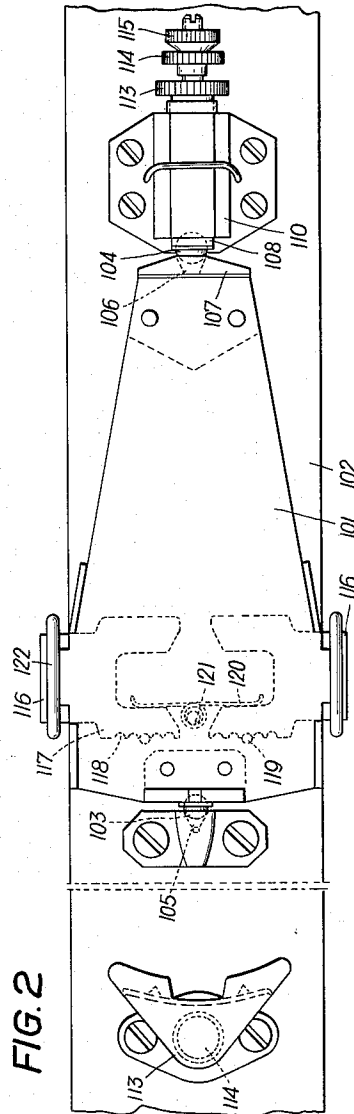
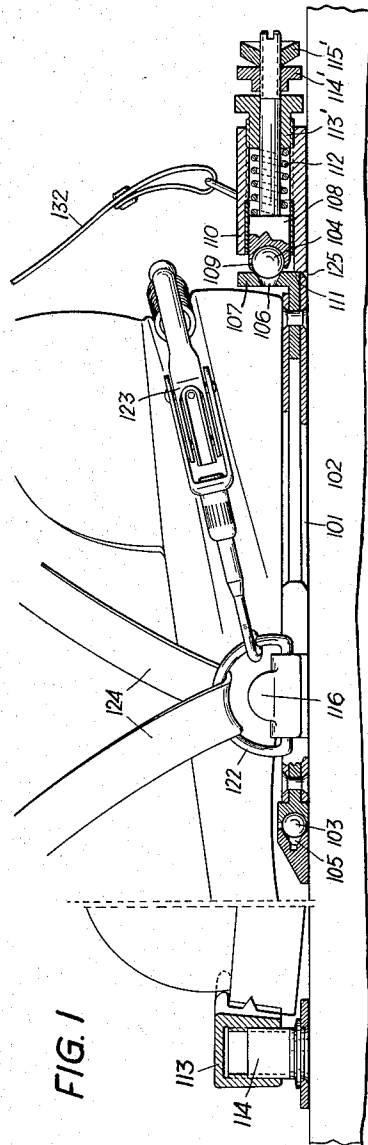
R. HATLAPA

3,244,431

SKI BINDING

Original Filed April 25, 1962

5 Sheets-Sheet 1



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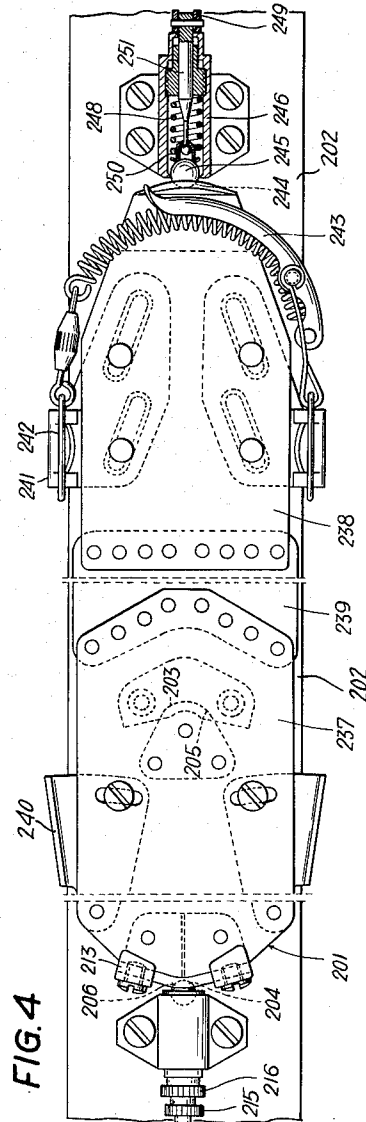
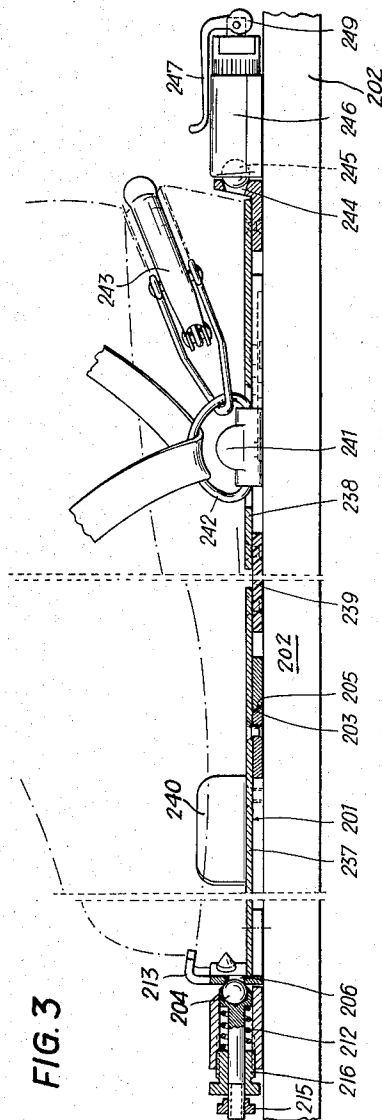
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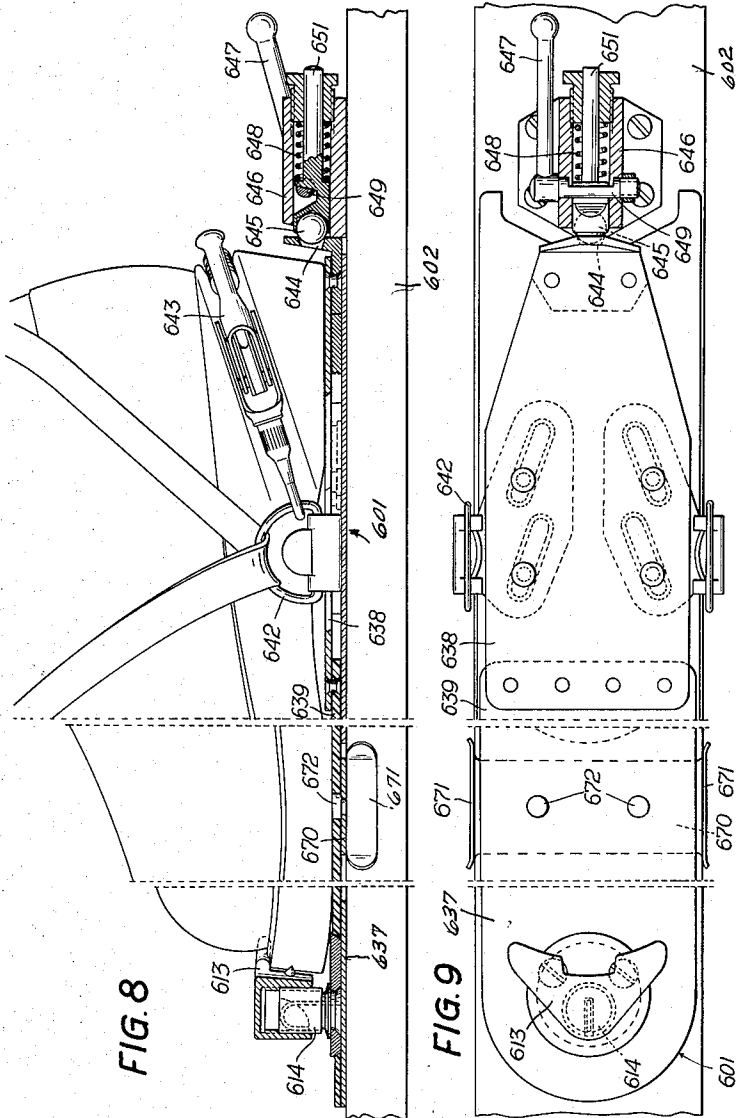
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SKI BINDING

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3,244,431

SKI BINDING

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Original application Apr. 25, 1962, Ser. No. 190,064, now Patent No. 3,186,727, dated June 1, 1965. Divided and this application Oct. 12, 1964, Ser. No. 403,110

Claims priority, application Germany, May 3, 1961,

H 42,534

3 Claims. (Cl. 280—11.35)

This is a divisional application of the pending application Serial No. 190,064, filed April 25, 1962, now Patent No. 3,186,727 issued June 1, 1965.

The present invention relates to a ski binding for connecting the skis with the boot.

Various bindings are known for this purpose. For instance, cables slung around the heel, rocker arms, with tension fork gripping over the rear edge of the heel, telescopic guided tension forks and similar provisions have been proposed before. The constructions are mostly provided with spring members, lifting flanks and so on, which are arranged to automatically release the binding in case of overstrain.

Most of these constructions comply with this purpose insufficiently only; this is due to the disturbing frictional forces usually arising in the cable guides, sliding blocks, telescopes and on the boot soles; these frictional forces bring about the result that the binding either does not hold or in case of emergency does not correctly open. Nearly all these bindings have only one degree of freedom for opening when overloaded, thus two different bindings at a time must be coupled together. Mostly a binding for tightening down the heel opening at a vertical overstrain and a binding of the boot tip opening at a horizontal excessive torsional load are used in combination. A heavy construction, non-balanced adjustable members or necessary fittings on the boot are further disadvantages of bindings of this kind.

It is, therefore, one object of the present invention to provide a ski binding which avoids these drawbacks.

It is another object of the present invention to provide a ski binding which includes a heel sole plate, as well as means for rigidly attaching and strapping the heel sole plate to a ski boot, which heel sole plate rests on and is restrained on the ski by abutments, at least one of which is spring-biased, and the abutments disengaging the heel sole plate from the ski in case of a vertical or a horizontal overstrain and permitting the heel sole plate to be engaged again with said abutments.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

FIGURE 1 is a side elevation, partly in section, of a first embodiment of the ski binder;

FIG. 2 is a top plan view thereof;

FIG. 3 is a longitudinal section of a second embodiment of the ski binding;

FIG. 4 is a top plan view thereof;

FIG. 5 is a top plan view of the second embodiment of the ski binder, showing a slight variation thereof;

FIG. 6 is a longitudinal section of the second embodiment of the ski binding disclosing still a further variation thereof;

FIG. 7 is a top plan view of the variation shown in FIG. 6;

FIG. 8 is a side elevation of the ski binding indicating a variation of the embodiment disclosed in FIG. 5; and

FIG. 9 is a top plan view thereof.

Referring now to the drawings, and in particular to FIGS. 1 and 2, the first embodiment of the present inven-

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tion comprises as a disengageable holder, according to the present invention, a heel sole plate 101 which rests on the ski 102 and is secured by means of an immovable ball 103 and a spring biased larger ball 104. The ball 103 rests in a seat 105, which is rigidly screwed to the ski 102. A second seat 106 for the larger ball 104 is provided in the boot backstop 107 of the plate 101. The ball 104 is embedded in a spring pin 108 and is secured by a flange 109 against falling out. Closely behind the plate 101 is arranged a guidance housing 110 for the spring pin 108; the guidance housing 110 is rigidly screwed to the ski and abuts the plate 101 with its surface 111 from behind. A spring 112 presses the spring pin 108 with the ball 104 into the seat 106 and abuts by way of an adjustment screw 113' against the guidance housing 110. The end of the spring pin 108 passing through the adjustment screw 113' carries the counter nuts 114' and 115' by which a forward movement of the spring pin 108 is limited.

Two side flanges 116 are inserted into the double walled heel sole plate 101, the flanges 116 being secured against being drawn out by catches 117, and being provided with arresting grooves 118 which engage pins 119 of the plate 101. A spring blade 120 is attached to a rivet 121 and presses the side flanges 116 against the pins 119 causing the latter to snap into the grooves 118. Outside the plate 101, the side flanges 116 have rings 122, where a longitudinally adjustable heel tightener 123 is hooked in. The heel tightener 123 presses the boot forwardly in the direction of a front swivel jaw 113 which is pivoted on the threaded pin 114 and which retains the boot on the plate 101 and thus also on the ski 102.

The rings 122 serve additionally the purpose of fixing a long strap binding 124 for downhill runs, the binding 124 propping the ankle joint.

In case of a torsional fall, the heel will turn around the front swivel jaw 113 and 114 and the ball 104 gives way against the pressure of the spring 112. Consequently the heel sole plate 101, remaining on the boot, turns somewhat around the ball 103, glides from the surface 11, and becomes completely free together with the boot. The latter is connected with the ski only by means of the ankle catch strap 132, which is capable of being drawn out and is secured to a lug on the guidance housing 110.

In case of a fall in a forward direction the same action occurs analogously in a vertical direction.

After the fall the runner must press the top of the boot against the front swivel jaw 113 and tread down with the heel. Thereby, the facet 125 of the back stop 107 presses back the ball 104 which again engages the seat 106 and closes the binding.

The second embodiment of the present invention, which is disclosed in form of three examples, comprises a combined touring and downhill running binding according to the present invention.

As shown in FIGS. 3 and 4, the disengageable holder comprises a sole plate 201, which is riveted together of rigid portions 237 and 238 and a flexible connecting portion 239. The portion 237, alike the first embodiment is retained on the ski between a rigid abutment, namely the round nose 203 in the seat 205, and a yielding abutment formed by a ball 204 in a seat 206 biased by a spring 212, however, contrary to the first embodiment, turned for 180°. The position of the ball 204 is fine-adjusted by means of a nut 215, whereas the tension of the spring 212 is chosen by means of an adjustment nut 216. Adjustable side flanges 240, giving the boot a lateral guidance, are provided on the rigid portion 237, which lies under the ball of the foot.

The round nose 203 is riveted to the rigid portion 237 of the sole plate 201. The seat 205 is screwed to the ski 202. On the portion 238 of the sole plate 201 are mounted adjustable jaws 241. A bent-lever rear tightener 243 is

hooked into rings 242 of the jaws 241. If in case of a fall during a touring run overstrains occur, the spring 212 of the ball 204 yields, the ball 204 gives way against the force of the spring 212 and the plate 201 is loosened from the ski 202.

At its rear end the sole plate 201 is equipped with a seat 244 which is engaged by a spring loaded ball 245 of the detent 246 if the lever 247 is tilted and a spring 248 of the detent 246 is released. The seat 244 is formed to be steep in its upper part and to run flat on its sides, thus mainly serving as a rear holding-down device, however, rendering small resistance against torsional forces. An eccentric 249 of the lever 247 is connected with the spring 248 by means of a cup disc 250 and a tie rod 251.

The rigid portion 237 of the sole plate 201 carries on its front jaws 213, which form the stop and the holding-down device.

In FIG. 5 the sole plate 301, again consisting of two rigid portions 337 and 338, as well as of the elastic intermediate member 339, is secured at its front by laterally arranged, disengageable and spring biased abutments, which are formed here by balls 302' and seats 304. The balls 302' are biased by springs 303 and the latter are adjusted in turn by means of screw caps 329. The seats 304 are worked into flanges 352 of the carrier 353; the latter is screwed to the ski 302.

The jaws 340 and 341, as well as the rings 342, the rear tightener 343 and the jaw 313 correspond with the embodiment disclosed in FIGS. 3 and 4. The rear detent 344 to 349 is likewise identical.

In FIGS. 6 and 7, the sole plate 401 again comprises the elastic intermediate portion 439, the jaws 440 and 441, the bent-lever rear tightener 443 and the front swivel and holding-down jaw 413 and is secured by the rigid portion 437 on a journal 454, serving as a front abutment; the journal 454 is screwed to the ski, whereas the other abutment is formed by the detent 444 to 451, which is identical with that shown in FIGS. 3 to 5. The rigid portion 437 has a star-shaped aperture 455; the toothed segments 456 of this aperture are cranked and rest on the cylinder 457 of the journal 454. The toothed segments 456 are secured by a wire spring 458 against an upward pull; the spring 458 bevels partly into the cranks 459 of the toothed segments 456 and engages partly the recesses 460 of the journal 454. The recesses 460 are deeper than the corrugations of the wire spring 458 and, therefore, this can deform and can enter deeper the recesses 460, if the pull of the toothed segments 456 becomes too strong; correspondingly the outer diameter of the wire spring 458 decreases, so as to disengage the sole plate 401 in case of a fall. If in case of a torsional fall, the detent 444 to 451 opens and the sole plate 401 is turned slightly, the toothed segments 456 will coincide with the corrugations of the wire spring 458 and the sole plate 401 will be free, too, in this case without any pull, however.

If the ball 445 of the rear detent is released by tilting the lever 447, the rigid portion 438 of the sole plate 401 can follow easily the movements of the boot heel when touring. In this case the sole plate 401 is safe guarded against unintentional turning on the ski by the ball 461, which is guided in the hollow threaded pin 414 of the swivel jaw 413; the ball 461 is biased by the vertical spring 462, the tension of the spring 462 being controlled by the screw 463, which passes vertically through the swivel jaw 413. The seat 464 for the ball 461 is screwed to the ski.

In FIGS. 8 and 9 the fulcrum of the sole plate 601, resting on the ski coincides with the vertical screw bolt 614 of the swivel and holding-down jaw 613. The second abutment yielding at overstrain is identical with the embodiment according to FIGS. 6 and 7 and has the same reference numerals (increased by adding 200) 644 to 651. Here again the mid-portion 639 of the sole plate 601 is of flexible material, and is riveted, cemented or welded to the rigid end portions 637 and 638. The boot is clamped be-

tween the holding-down device or jaw 613 and the bent-lever rear tightener 643, which engages the sole plate 601 at adjustable rings 642.

In case of forward falls the ball 645 gives way and the sole plate 601 bends upwardly. In case of torsional falls the ball 645 yields elastically, too, however, with substantially smaller forces, and the sole plate 601 turns around the bolt 614 and depending on the position of the foot during the fall, the plate 601 will twist. If the rear detent 644 to 651 is released intentionally by tilting the lever 647 for touring, a guidance for the sole plate 601 and for the boot secured thereto is provided by inserting a sliding support 670, which engages the lateral edges of the ski by means of downwardly directed jaws 671 and which laterally guides the boot with upwardly bent pins 672.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. A ski binding comprising a heel sole plate, means for rigidly attaching and strapping said heel sole plate to a ski boot, said heel sole plate resting on the ski, at least one spring biased abutment for retaining said heel sole plate on the ski, means for releasing at least one end of said heel sole plate from one of said abutments in order to disengage at least partly said heel sole plate from said ski in case of a vertical or a horizontal overstrain and to permit said heel sole plate and said abutment to be engaged again, lateral jaws limiting a lateral movement of the ski boot, said jaws being attached to said heel sole plate and adjustable to various heel widths, said jaws consisting of ring lugs, and a heel loop tightener including a bent-lever as well as a strap binding secured to said ring lugs.
2. The ski binding, as set forth in claim 1, which includes a holding-down device disposed in front of the ski boot tip and adjustable as to height, and means permitting turning the heel portions of the ski boot about the axis of said device in case of a horizontal overstrain.
3. The ski binding, as set forth in claim 1, wherein said releasing means include means for disengaging said heel sole plate completely from said ski.

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