

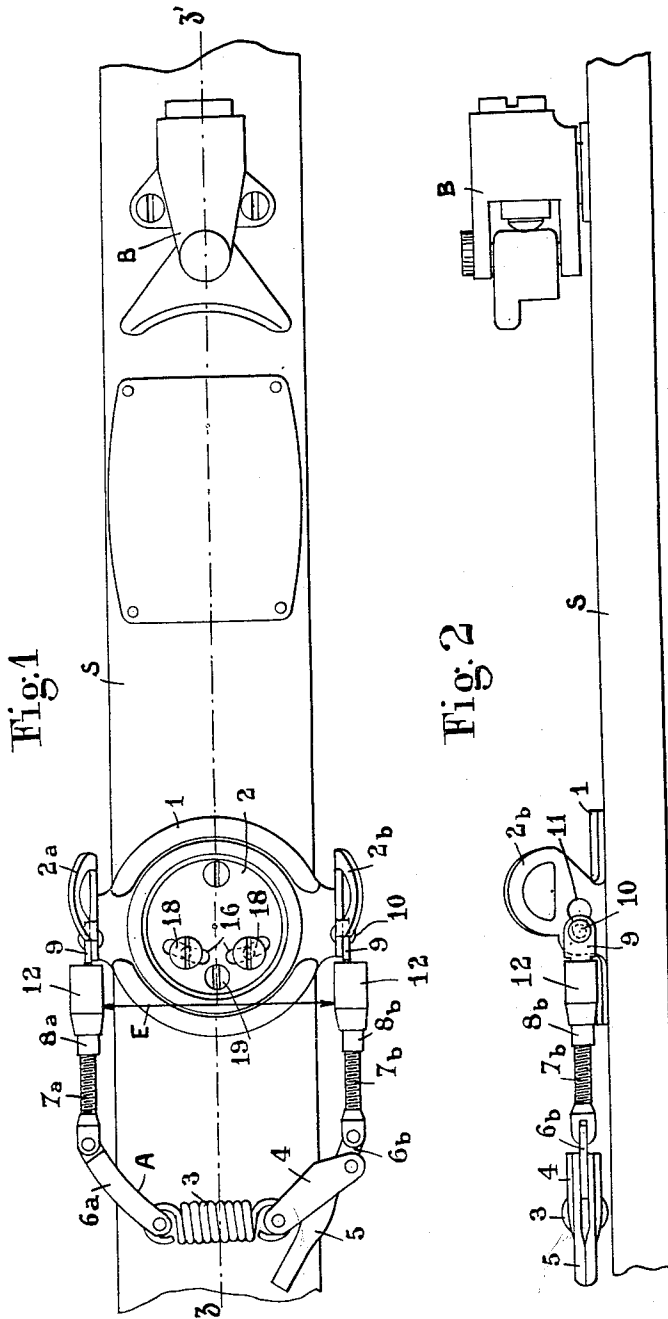
March 9, 1965

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LATERALLY ADJUSTABLE CABLE END ATTACHMENT
FOR A SKI BINDING ROTARY HEEL PLATE

3,172,678

Filed June 28, 1963

2 Sheets-Sheet 1



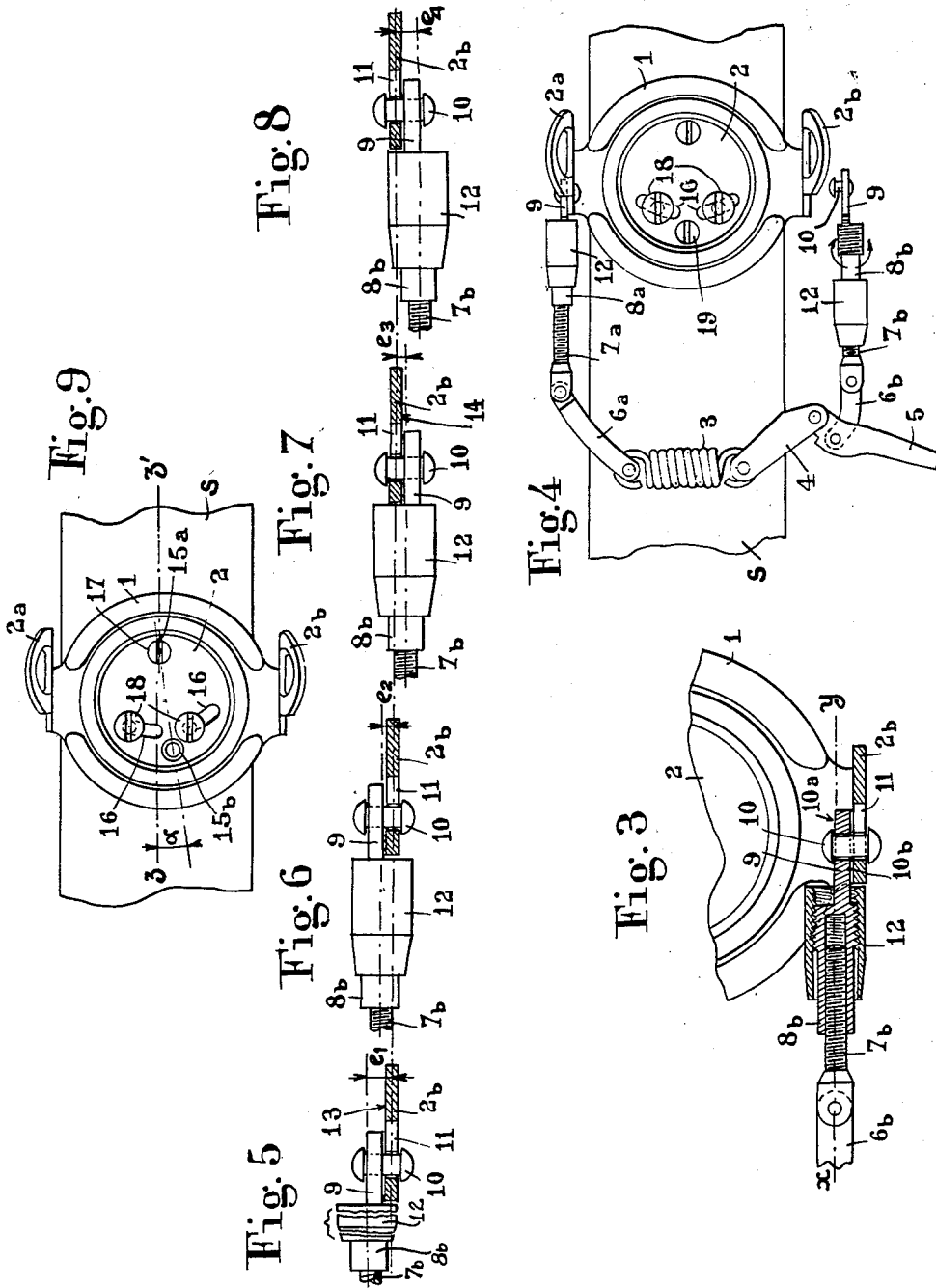
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11 Claims. (Cl. 280—11.35)

This invention relates to ski binding devices of the type adapted to hold, in relation to the top face of a ski, the heel portion of a ski boot having its toe end held against motion by any other suitable binding means.

More particularly, the present invention relates to heel-type ski binders wherein a bow comprising several pivotally interconnected sections is adapted to fit around the heel of the ski boot, the front end elements of the side arms of this bow being secured on vertical ears or brackets disposed on either side of the ski. These ears are carried as a rule by a swivel plate underlying the heel of the ski boot, this swivel plate being adapted to support the heel and retained on the top face of the ski, for example by means of a disc engaging a central aperture of the plate and secured on the ski by means of screws or the like. The bow portion of these binding devices comprises, among component elements, a traction spring and a clamping lever.

However, in order to permit the engagement of different boot sizes in devices of this general character, some adjustment means must be provided whereby the width and length of the rear bow may be altered at will. Now, hitherto known means for effecting these adjustments in devices of this type are scarcely satisfactory. In fact, some of these known means are relatively complicated and costly. Others of simpler construction are liable to misadjustment in case of strong shocks as currently applied to devices of this character. This applies notably to adjustment means comprising screws and/or nuts likely to become loose under the influence of shocks and vibration.

In view of the foregoing it is the essential object of this invention to provide a device of the type set forth hereinabove which comprises adjustment means particularly simple in design and not liable to untimely misadjustment when subjected to shocks and vibration.

The ski binder according to this invention is characterized essentially in that each one of the component elements constituting the front end elements of the side arms of the aforesaid bow of the device comprises a lug provided with a rivet sliding freely in the transverse direction and which is thus adapted to be engaged and anchored by either of these end elements in a button-hole like aperture formed in the corresponding fastening lug. Thus, each lug may be secured on the corresponding ear either against the inner face or against the outer face thereof, with a view to alter the relative spacing between each end element and the longitudinal center axis of the ski, and therefore to change the width of said bow. Besides, adequate means are provided for subsequently locking each end element and holding each anchoring rivet in its relevant button-hole.

According to a further feature characterizing this invention, the lug carried by each end element is shifted with respect to the axis of this element, whereby the relative spacing between this element and the longitudinal center line of the ski may be modified by turning this element the other way so as to cause it to engage the corresponding fixed ear with one or the other face.

Other features and advantages of this invention will appear as the following description of the device con-

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stituting the subject-matter thereof proceeds with reference to the accompanying drawings illustrating a typical form of embodiment of the invention. This description should not be construed as limiting the field of the present invention as many modifications may be made therein without departing from the spirit and scope of the invention.

In the drawings:

FIGURES 1 and 2 are fragmentary views showing in plan view from above and in elevation respectively a ski equipped with the binding device of this invention;

FIGURE 3 is a fragmentary view showing partly in plan view from above and partly in horizontal section the same device;

FIGURE 4 is a plan view from above of the same device;

FIGURES 5 to 8 are detail plan views showing the different positions in which each end lug of the heel bow may be positioned in relation to the corresponding ear; and

FIGURE 9 is a plan view from above showing the device during its adjustment in the transverse direction.

Referring first to FIGS. 1 and 2 of the drawings, a ski S equipped with the binder of this invention for holding the heel portion of a ski boot in position carries inter alia adequate means for holding or retaining against abnormal motion the toe end of the same ski boot, for example in the form of a rotary safety binder B.

The ski binder of this invention comprises more particularly a swivel plate 1 carrying on either side a substantially vertical ear or bracket 2a, 2b, these ears or brackets being adapted to extend on either side of the heel portion of the boot and to constitute means for anchoring the front ends of the clamping bow A to be fitted around the heel of the ski boot. Each ear 2a, 2b has an inner face turned toward the other ear, and an outer face turned the opposite way. The swivel plate 1 is retained on the top face of the ski by a fixed disc 2 fitting in a circular opening formed in said plate and comprising an outer raised peripheral marginal portion or flange overlying the edge of said circular opening. The disc 2 is secured on the ski by means of screws, as will be explained more in detail presently.

The bow A comprises in the known fashion a coil tension spring 3 and a clamping device 4 of the conventional knee-action type, incorporating a control lever 5. This bow further comprises two rods or links 6a, 6b pivoted respectively on the spring 3 and on the control lever 5 of the clamping device. Pivoted on these rods or links are screw-threaded side rods 7a, 7b carrying the end elements 8a, 8b of the bow structure, which are adapted to be secured on the ears 2a, 2b of the swivel plate respectively.

Each end element 8a, 8b carries a lug 9 having its two main faces parallel to each other and to the axis x-y of the element (FIG. 3). Each lug 9 has a hole formed therein which is freely engaged by a two-headed rivet 10, the length of the shank of this rivet 10 being greater than the lug thickness. On the other hand, the plane of symmetry of each lug 9 is shifted laterally in relation to the axis x-y of the relevant element 8a or 8b. Thus, one of its faces 10a may be coplanar with the axis x-y and its other face 10b lies on one side of this axis.

Each ear 2a, 2b has a button-hole or like opening 11 formed therethrough which comprises a front portion of greater diameter, adapted to receive any one of the rivet heads therethrough, and a rear portion in the form of a narrower slot adapted to be engaged by the shank of the rivet but not by its head. Each lug 9 has a length sufficient to permit the insertion of one or the other head of rivet 10 through the larger portion of the corresponding button-hole 11. A socket 12 is screwed on each end

element 8a, 8b and constitutes a locking device therefor, as will be explained presently.

Each end element of bow A is secured on the corresponding ear 2a or 2b by anchoring the rivet 10 carried by its lug 9 in the button-hole opening 11 of the relevant ear. However, since each retaining rivet 10 is mounted for free sliding movement in the corresponding lug 9, this lug 9 can be secured in different positions on the anchoring ear associated therewith. Thus, each lug 9 may be secured on this ear either against the inner face 13 thereof (see FIGS. 5 and 6) or against its outer face 14 (see FIGS. 7 and 8). Of course, either position corresponds to a different relative spacing between the axis x-y of the end element and the relevant anchoring ear and therefore to a modified width E of the bow A. On the other hand, in each one of the above-defined positions each end element may be turned the other way to engage the same face of the corresponding ear 2a or 2b either with its inner face 10a coplanar with the axis x-y, or with its outer face 10b shifted laterally in relation thereto. Another consequence of this arrangement is the possibility of altering the relative spacing between the axis x-y of the end element and the corresponding fixation ear. To sum up, four different positions are available for each end element in relation to the relevant ear 2a or 2b, these positions corresponding to different lateral spacings e1, e2, e3 and e4 between the axis x-y of the end element and the anchoring ear associated therewith, these spacings differing either by their magnitude or by their direction. The different positions thus obtainable for one of the end elements, in this case the right-hand element 8b of the device, are illustrated in FIGS. 5 to 8 of the drawings respectively.

However, the element 8a is also adapted to be mounted in four similar different positions on the corresponding ear 2a. Of course, each one of the different positions available for the end element 8a may be combined with one of the possible positions of the other element 8b, thus providing sixteen different possible positions, although some of these correspond to the same lateral spacing E of the two side arms of bow A. Thus, in practice, eight different combinations are obtainable whereby, for example, the width E of bow A can be varied 2 millimeters each time between, say, a minimum spacing of 66 millimeters and a maximum spacing of 80 mm. Now, as a matter of fact, this range corresponds to the different widths of conventional ski boot heels. Under these conditions, with the device of this invention the width of the rear bow can be adjusted in a simple yet efficient manner so that this width corresponds exactly to the width of the boot heel.

When fastening the lug 9 at either end of the bow A, either of the two heads of its anchoring rivet 10 is engaged through the larger front portion of the corresponding button-hole 11, and the element is subsequently pulled backwards to engage the shank of rivet 10 into the narrower or slot-forming rear portion of the button-hole, so that the corresponding head is retained laterally by the edges of this rear portion. However, the corresponding end element and its lug 9 should subsequently be prevented from moving forwards since this would permit an untimely disengagement of the head of the anchoring rivet. As already mentioned hereinabove, the socket 12 carried by each end element is adapted to constitute an efficient locking member to avoid this undesired disengagement (FIG. 3). To this end, the socket 12 is simply screwed on the corresponding end element 8a or 8b until the socket contacts the rear edge of the corresponding ear 2a or 2b. Thus, the end element and lug 9 are held against longitudinal motion and any undesired release of the anchoring rivet is safely prevented. However, the sockets 12 do not interfere whatsoever with the pivoting movements of the end portions of bow A, since the rear edges of the two ears 2a and 2b are rounded.

As already stated, each end element 8a, 8b is secured by screwing on a side rod 7a or 7b forming part of the bow A. Thus the length of the side arms of this bow A may be modified and adjusted at will by screwing in one or the other direction and more or less each end element on the corresponding screw-threaded rod 7a or 7b. However, before effecting this adjustment on one of the end elements, this element must be disengaged from its anchoring ear (see FIG. 4). When the longitudinal adjustment is completed, each end element is again anchored on the associated ear whereby the desired adjustment cannot be altered accidentally. In fact, both end elements 8a, 8b are prevented from revolving with respect to the screw-threaded rods 7a, 7b, thus precluding any risk of accidental misadjustment in the bow length in case of shocks or vibration.

According to a preferred form of embodiment of the device of this invention, the disc 2 provided for retaining the swivel plate 1 is designed with a view to permit a particularly easy and efficient adjustment of the position of the device on the ski in the transverse direction, when mounting the device. To this end, the disc 2 is formed with a pair of diametrically opposite holes 15a, 15b adapted to be positioned the one at the front and the other at the rear. This disc is also formed with a pair of curved slots 16 of which the center of curvature is coincident with the center of hole 15a.

To mount the device of this invention on a ski the user first positions this hole 15a on the longitudinal center line z-z' of the ski and engages through this hole the first fastening screw 17 which is used first as a pivot pin for completing the fixation of the disc 2. With the other hole 15b also disposed on the axis z-z' the other two screws 18 are engaged through the two slots 16, intermediate their ends. Thus the disc 2 is retained on the ski by the three screws 17 and 18 while being movable laterally in one or the other direction, the screw 17 acting as a pivot pin whilst the other screws 18 are adapted to slide in the curved slots 16. Thus the disc 2 and the swivel plate 1 can be moved laterally in either direction to bring them exactly in the desired position. FIG. 9 illustrates these two members in one of their endmost positions after pivoting through an angle α in relation to the center of screw 17.

Upon completion of this adjustment, the disc 2 may be locked in position by engaging a fourth screw 19 through the hole 15b. Thus the disc is definitely held in position.

With the ski binder construction of this invention the different adjustments that may be required according to specific cases and circumstances can be made very easily by using particularly simple and economical means. In fact, it permits first the adjustments of the width of the bow A by altering the position of one or the other end element 8a or 8b with respect to the relevant fixation ear. Second, the length of the side arms of the aforesaid bow can be adjusted by simply screwing these end elements in relation to the screwthreaded rods 7a or 7b. Finally, it affords a particularly easy and accurate adjustment of the position of the swivel plate 1 and therefore of the anchoring ears 2a, 2b in the transverse direction, in relation to the ski.

Although the present invention has been described in conjunction with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

What I claim is:

1. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said support means, said ears being disposed on

either side of the boot position and having each an inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said clamping means comprising a pair of front side end elements adapted to be attached to said lateral ears, anchoring means adapted to permit the fixation of each front end of said clamping means on said corresponding lateral ear including lugs adapted to contact the sides of said ears, a double headed rivet having a shank positioned in said lug transverse to the plane thereof, said rivet loosely fitted to slide longitudinally in said lug and engaging the selected one of the inner and outer face of said lateral ear.

2. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said support means, said lateral ears being disposed on either side of the boot position and having each an inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said clamping means comprising a pair of front side end elements adapted to be attached to said lateral ears, each one of said end elements carrying a flat anchoring lug of which the plane of symmetry is shifted laterally in relation to the longitudinal axis of the relevant end element of said clamping means, anchoring means in the form of a double headed rivet having a shank positioned in said lug transverse to the plane thereof, said rivet loosely fitted to slide longitudinally in said lug and adapted to permit the fixation of said lug of each front end of said clamping means on said corresponding lateral ear by engaging the selected one of the inner and outer face thereof.

3. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination a plate adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said plate, said ears extending on either side of the boot position on the ski and having each an inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said means comprising two front end elements adapted to be anchored on said lateral ears, said lateral ears being each formed with a button-hole opening comprising a large portion opposite said clamping means and a narrower portion adjacent to said clamping means, each end of said clamping means carrying a two-headed rivet extending freely through a hole formed in the relevant end element, said rivet being adapted to engage with one of its heads said larger portion of said buttonhole of the corresponding lateral ear carried by said plate, whereby the corresponding end element of said clamping means may be secured at will by means of said rivet against the selected one of said inner and outer faces of one of said lateral ears of said plate, said rivet being adapted to be subsequently brought back into said narrower portion of the relevant buttonhole opening of said lateral ear.

4. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination a plate adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said plate, said ears being disposed on either side of the boot position and having each an inner face turned toward the other lateral ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said clamping means comprising two front end elements adapted to be anchored on said lateral ears, each one of said end elements carrying a flat fixation lug having its plane of symmetry shifted laterally in relation to the axis of the relevant end element, a button-hole opening

formed in each lateral ear, said opening comprising a larger portion opposite said clamping means and a narrower portion adjacent to said clamping means, each fixation lug of said end element of said clamping means carrying a two-headed rivet extending through said end element and slidably mounted therein, said rivet being adapted to be engaged with one of its heads into said larger portion of said button-hole opening in one of said lateral ears of said plate, whereby the corresponding lug of the end element of said clamping means may be secured at will, by means of said rivet against the selected one of said inner and outer faces of one of said lateral ears of said plate, said rivet being adapted subsequently to be moved back into said narrower portion of the relevant button-hole opening of said lateral ear.

5. A ski binder as set forth in claim 4, wherein the front end elements of said clamping means carry in the vicinity of their fixation lug a screw socket adapted to constitute an abutment by engaging the corresponding lateral ear of said plate when the rivet of the corresponding fixation lug is brought into the narrower portion of the button-hole opening in the relevant lateral ear of said plate, thereby preventing said rivet from moving towards said larger portion of said button-hole opening.

6. A ski binder of the type adapted to hold the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be secured on the ski, a pair of substantially vertical lateral ears rigid with said support means and disposed on either side of the boot position and having each an inner face turned toward the opposite ear and an outer face turned the opposite way, clamping means adapted to fit around the rear portion of the heel of the boot to be bound, said clamping means comprising two front end elements adapted to be secured on said lateral ears respectively, a screw-threaded rod on each one of said end elements, a flat anchoring lug on each one of said end elements, the plane of symmetry of said lug being shifted in relation to the longitudinal axis of said screw-threaded rod of the corresponding end element of said clamping means anchoring means in the form of a double headed rivet having a shank position in said lug transverse to the plane thereof, said rivet loosely fitted to slide longitudinally in said lug and adapted to permit the anchoring of said lug of each end element of said clamping means on said corresponding lateral ear against the selected one of said inner and outer faces thereof.

7. A ski binder of the type adapted to hold the heel portion of a ski boot on a ski, which comprises in combination a disc adapted to be secured on the top face of the ski, a swivel plate formed with a circular aperture and rotatably mounted around said disc, an annular flange portion of said disc retaining said swivel plate in position, said disc comprising at least one hole for the passage of a first fastening screw as well as two curved slots centered on said hole, said two curved slots being adapted to receive two other fastening screws, a pair of substantially vertical lateral ears rigid with said swivel plate, said lateral ears being disposed on either side of the boot position on said ski and having each an inner face turned toward the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the boot to be bound, said clamping means comprising two front end elements adapted to be secured on said lateral ears, fastening means adapted to permit the fixation of each end element of said clamping means on said corresponding lateral ear against the selected one of said inner and outer face.

8. A ski binder of the type adapted to hold the heel portion of a ski boot on a ski, which comprises in combination a disc adapted to be secured on the top face of the ski, a swivel plate formed with a circular aperture and rotatably mounted around said disc, an annular flange portion of said disc retaining said swivel plate in position, said disc comprising at least one hole for the passage of a

first fastening screw as well as two curved slots centered on said hole, said two curved slots being adapted to receive two other fastening screws, a pair of substantially vertical lateral ears rigid with said swivel plate, said lateral ears being disposed on either side of the boot position on said ski and having each an inner face turned toward the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the boot to be bound, said clamping means comprising two front end elements adapted to be secured on said lateral ears, each one of said end elements carrying a flat anchoring lug of which the plane of symmetry is shifted laterally in relation to the longitudinal axis of the relevant end element of said clamping means, anchoring means adapted to permit the fixation of said lug of each front end of said clamping means on said corresponding lateral ear by engaging the selected one of the inner and outer face thereof.

9. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said support means, said lateral ears being disposed on either side of the boot position and having each inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said clamping means comprising a pair of front side end elements adapted to be attached to said lateral ears, each one of said end elements carrying a fastening member rotatably mounted on the corresponding end portion, a flat lug rigid with each one of said fastening members and having two flat faces parallel to the center line of the corresponding end portion of said fastening means, the plane of symmetry of each lug being offset in relation to the center line of the corresponding end of said clamping means, additional fastening means provided respectively on said lateral ears and on said lug of said fastening members of said end portions of said clamping means, said fastening means being adapted to permit the fastening of each one of said lugs on the relevant lateral ear by engaging against said ear the face selected among said two faces of each one of said fastening lugs.

10. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said support means, said lateral ears being disposed on either side of the boot position and having each an inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of

the heel of the ski boot to be bound, said clamping means comprising a pair of front side end elements adapted to be attached to said lateral ears, each one of said end elements carrying a fastening member rotatably mounted on the corresponding end portion, a flat lug rigid with each one of said fastening members and having two flat faces parallel to the center line of the corresponding end portion of said fastening means, the plane of symmetry of each lug being offset in relation to the center line of the corresponding end of said clamping means, additional fastening means provided respectively on said lateral ears and said lug of said fastening members of said end portions of said clamping means, said fastening means being adapted to permit the fastening of each one of said lugs on the corresponding lateral ear by applying the face selected among said two faces of each one of said fastening lugs against the face selected among the inner and outer faces of said ear.

11. A ski binder of the type designed for holding the heel portion of a ski boot on a ski, which comprises in combination support means adapted to be mounted on the top face of the ski, a pair of substantially vertical lateral ears rigid with said support means, said vertical lateral ears being disposed on either side of the boot position and having each an inner face turned toward the inner face of the other ear and an outer face turned the opposite way, clamping means adapted to surround the rear portion of the heel of the ski boot to be bound, said clamping means comprising a pair of front side end elements adapted to be attached to said lateral ears, each one of said end elements carrying a fastening member rotatably mounted on the corresponding end portion, a flat lug rigid with each one of said fastening members and having two flat faces parallel to the center line of the corresponding end portion of said fastening means, the plane of symmetry of each lug being offset in relation to the center line of the corresponding end of said clamping means, an opening in said lug, a double-headed rivet having its shank in said opening, the length of said shank being at least equal to the thickness of said lug plus the thickness of said ear.

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