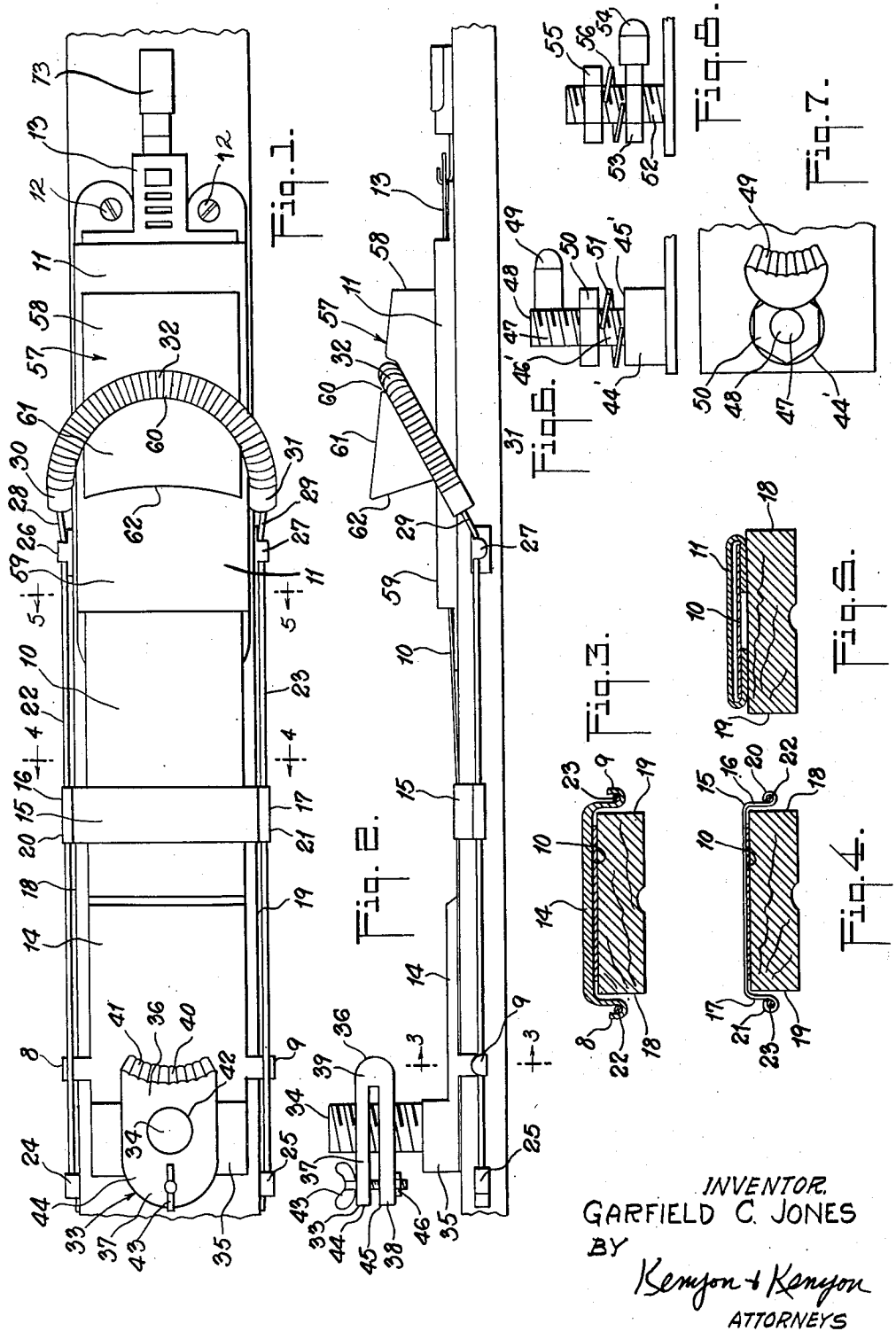
April 22, 1958 G. C. JONES 2,831,696

SKI BINDING

Filed July 5, 1955 2 Sheets-Sheet 1



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SKI BINDING

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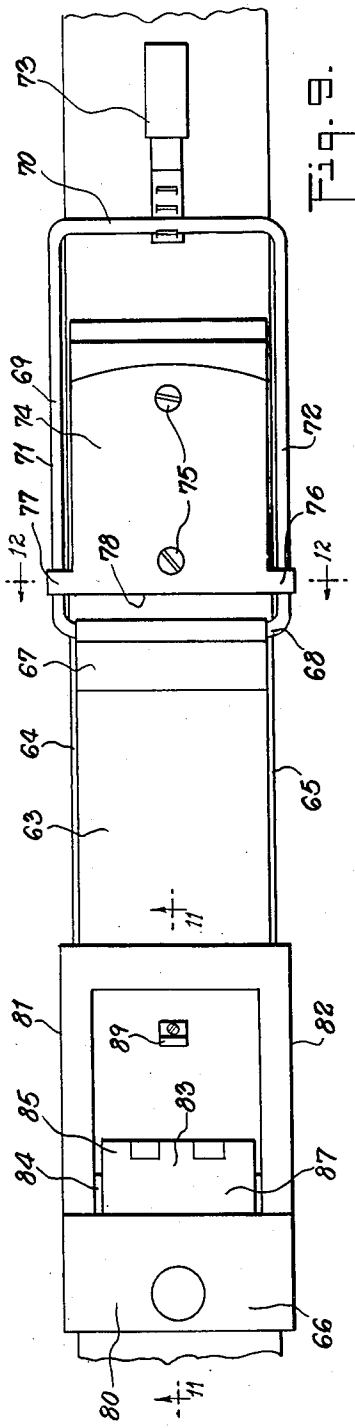


Fig. 9.

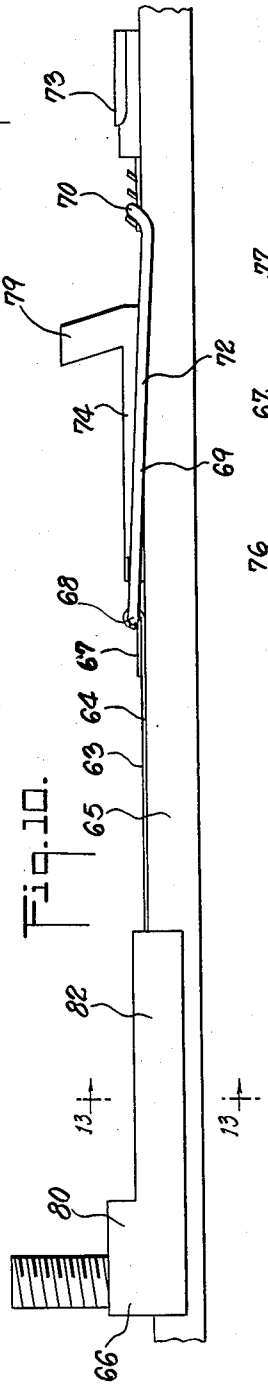


Fig. 10.

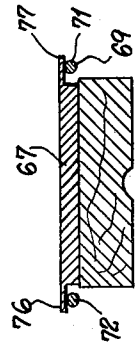


Fig. 12.

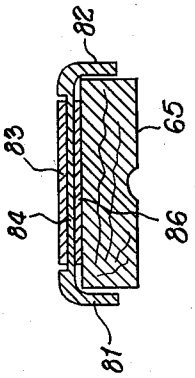


Fig. 13.

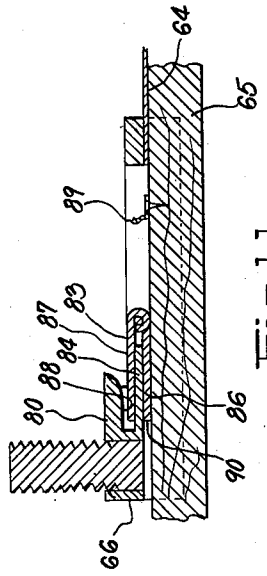


Fig. 11.

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SKI BINDING

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4 Claims. (Cl. 280—11.35)

The present invention relates to a binding for securing a ski boot to a ski, and more particularly to such a binding having improved safety features for effecting the release of the ski boot during an accident to minimize injury to the skier.

In the sport of skiing it has become increasingly desirable to have a ski binding which firmly holds the boot to the ski with a minimum of binding parts. It has further been desirable that the binding should accommodate varous sizes of boots without the necessity of making substantial and time-consuming alterations in the binding, or possibly even installing a different size binding altogether as the stuation might require.

In addition, skiers have long recognized the need for a binding which can be adjusted for downhill skiing, on the one hand, during which it is necessary that the heel of the ski boot be held firmly down against the top surface of the ski, and for touring or walking, on the other hand, when it becomes desirable to permit the boot heel to move up and down relative to the ski as the skier strides forward, yet maintain the boot otherwise securely fastened to the ski.

Perhaps of prime importance in a ski binding is the long recognized need for safety protection such that the skier will be freed from his skis in the event that any undue sidewise or lateral force is exerted on the bindings, e. g., due to a fall. Many serious injuries such as fractured legs and the like have resulted from the use of bindings lacking such requisite safety release features.

In view of the above-desired characteristics, it is an object of the present invention to provide a ski binding of simplified construction which is equally suitable for downhill skiing, on the one hand, and walking or touring on the other.

Another object of the present invention is to provide a simple durable ski binding which will release the ski boot in case of a lateral or twisting force thereon to minimize breaking or injuring the skier's leg.

A further object is to provide a binding having means for manually adjusting the limit of vertical movement of the ski boot heel relative to the ski.

Still other objects are to provide a binding which is easier to fasten and unfasten from the ski boot than conventional bindings, is simpler in construction, and is more easily fitted to different sizes of boots.

Other objects and features of the present invention will become apparent from the following description and accompanying drawings which disclose by way of example the principle of the invention.

In the drawings:

Fig. 1 is a plan view of a portion of a ski equipped with one form of the binding of the present invention;

Fig. 2 is a side elevation view of the device shown in Fig. 1;

Fig. 3 is a sectionalized view taken along line 3—3 of Fig. 2 showing one embodiment of the heel portion of the foot plate with cable-engaging hook members;

Fig. 4 is a sectionalized view taken along line 4—4 of Fig. 1 showing the adjustable strap assembly;

Fig. 5 is a sectionalized view taken along line 5—5 of Fig. 1 showing the foot plate guide member and foot plate assembly;

Fig. 6 is a side elevational view of one form of the heel-engaging means;

Fig. 7 is a plan view of the heel-engaging means of Fig. 6;

Fig. 8 is a side elevational view of an alternate form of heel-engaging means;

Fig. 9 is a plan view of a portion of a ski equipped with an alternate form of binding of the present invention;

Fig. 10 is a side elevational view of the binding shown in Fig. 9;

Fig. 11 is a sectionalized view of the heel-engaging assembly taken along line 11—11 of Fig. 9;

Fig. 12 is a sectionalized view of the toe plate assembly taken along line 12—12 of Fig. 9;

Fig. 13 is a sectionalized view of the heel-engaging assembly taken along line 13—13 of Fig. 10.

Fig. 1 shows one embodiment of the present invention as assembled on a ski. It comprises an elongated flexible foot or base plate **10** which is longitudinally disposed along the upper surface of the ski. The base plate **10** may be made of any suitable flexible or elastic material such as a spring metal or durable plastic, and, if not inherently so, should preferably be rust-proofed. The forward portion of the base plate is slideably received by a flattened guide sleeve **11** which is affixed to the upper surface of the ski by any conventional means such as wood screws **12**.

The forward end of the base plate **10** has a slotted extension **13** which is engageable by a conventional throw or clamping device **73** (not fully shown) and is thereby releasably securable to the ski.

The reinforced rearward end or heel portion **14** of the base plate **10** is adjustably movable up and down relative to the ski surface being limited in such movement to a manually preselected degree by the movable flat strap **15** which is slideably secured to the ski in a transverse overlying relation to the base plate **10**.

The strap end portions **16, 17** are curved downwardly over the respective sides **18, 19** of the ski and then outwardly to form respective looped end portions **20, 21** which ride on horizontal longitudinal cables **22, 23** (see also Fig. 4). The latter cables are mounted along the ski sides **18, 19** respectively and are secured by any suitable conventional means to the same at their rearward ends **24, 25**. The forward part of the cables are secured to the ski by hooks **26, 27** and the forward ends **28, 29** are joined to turnbuckles **30, 31** at the opposite ends of coil spring **32** which forms part of the toe-securing means of this binding. The turnbuckles **30, 31** are provided for maintaining the proper degree of tautness in the cables **22, 23**.

It is obvious that instead of the construction shown

other guide means may be used for the strap, such as rods or bars, or grooves may be cut into the sides of the ski and the end portions of the strap so shaped to fit slideably into such grooves.

Hooks 8 and 9 may be provided at either side of base plate 10 which may be engaged with the cables 22 and 23 respectively to assist in holding the base plate against the ski for downhill skiing when so desired.

On the aforementioned heel portion 14 of base plate 10 is mounted the ski boot heel-engaging assembly 33 (see also Fig. 2). It is comprised of a foundation, base member, or threaded post 34 rigidly affixed to the base plate 10 adjacent its rearward end portion 35, the latter preferably being reinforced for greater strength. Tong member 36 has two overlying adjacent plates 37, 38 which are joined together at a yoke 39 which has an arcuate shaped portion or cavity 40 adapted to engage the grooved portion of a ski boot heel (not shown). The cavity may have a knurled surface 41 to enhance the heel gripping qualities of the device.

A pair of registered holes 42 in the plates 37, 38 are tapped to permit the tong member to be threadably engaged with the post 34, and adjusted thereon to any desired height. Wing bolt 43 extends through the open ends 44, 45 of the respective plates and can be manually tightened with respect to its nut 46 to deform the said ends with respect to each other, i. e., press them toward one another, to thereby lock the tong member in the desired position on the said post 34. By varying the tightness of adjustment of the said wing bolt 43, it is apparent that the resistance to lateral or twisting force on the tong member relative to the said post may be proportionately varied and preselected by the skier.

Alternate forms of heel-engaging devices are shown in Figs. 6, 7 and 8. Fig. 6 shows a base member 44' which has a female threaded portion (not shown) in its upper face 45' into which is screwable the male threaded end portion 46' of rotatable shaft or bolt member 47 to any desired depth. Near the other end 48 of such bolt member 47 is mounted thereon a horizontally extending arcuate heel-engaging member 49 which serves the same purpose as the tong member 36 as above described. The bolt member 47 is lockable at any particular desired depth relative to the base member 44' by the turning of nut 50 back along threaded end portion 46' of the said bolt member against lock washer 51 which presses the latter against the upper surface 45' of said base member with a selectable pressure, depending on the force with which said nut is tightened. As this pressure varies bolt member 47 is rotatable in response to similarly varying twisting forces which may be applied thereto.

The embodiment shown in Fig. 8 employs a fixed threaded post 52, a threaded nut member 53 having the arcuate heel-engaging portion 54 formed integrally therewith, and nut 55 and lock washer 56 are used to lock the nut member 53 in a fashion similar to the other devices previously described herein. Even other well-known means of interconnecting the heel-engaging member and the post may be employed, the only requisites being relative axial adjustability so that the arcuate member may be adjusted for different heights from the base plate 10, and some means for locking the assembly in place once the desired height is chosen.

One form of toe-securing means 57 is shown in Figs. 1 and 2. It comprises a block member 58 which is slideably disposed on the upper surface 59 of the flattened guide sleeve 11. An arcuate groove 60 on the top 61 of said block is adapted to receive the curved coil spring 32 of the cable assembly. This coil spring holds the block down against the guide sleeve and exerts a rearward pull on the block as viewed in Fig. 2 to bring the rearwardly facing surface 62 against the toe of the ski boot (not shown) to hold the latter against the ski while forcing the heel thereof back against the heel-engaging means described above. The latter said surface is transversely curved and has a rearwardly projecting upper portion and is thereby adapted to properly fit the ski boot toe portion.

It is possible to use this binding without such block member 58, the coil spring 32 bearing directly against the upper front portion of the ski boot sole. The spring may be encased in rubber tubing or the like to protect the ski boot from abrasion if desired.

Figs. 9 and 10 show a second embodiment of the present invention. It is comprised of a base plate 63 disposed along the upper surface 64 of the ski 65 and having a vertically swingable rearward end 66 and a pivoted forward end 67. The latter end is pivotally attached to the transversely disposed rearward end 68 of an elongated wire frame 69 which is releasably securable to the ski at the forward frame end 70 by a conventional throw device or clamping means 73. The ends of said frame are of slightly greater width than the width of the ski so that the frame sides 71, 72 are disposed outwardly and adjacent the side surface of the ski. Such arrangement maintains the frame in a laterally stabilized position relative to the ski.

A toe plate 74 is affixed to the ski by any conventional means such as wood screws 75. Flanges 76, 77 at the rear edge 78 of said toe plate extend outwardly over the sides of the ski and over the rear portions of the sides 71, 72 of the wire frame 69 (see also Fig. 12). The flanges thus permit the frame to slide in a longitudinal direction relative to the ski for adjusting the binding to a ski boot, and cooperate with the clamping means in holding the frame affixed to the ski when the ski boot has been assembled in the binding.

On the forward end of the toe plate 74 is an upwardly and rearwardly extending projection 79 which is adapted to engage and retain a ski boot toe.

The rear portion 80 of the base plate 63 has downwardly projecting side portions 81, 82 which fit snugly against the respective adjacent side surfaces of the ski to prevent lateral movement of the base plate when the latter said portion is fully seated against the ski as shown in Fig. 10. The heel-engaging means is the same as any of those described above.

The swingable end 66 of the base plate 63 is releasably securable to the adjacent surface of the ski by latching means 83 which is comprised of a forwardly extending lip 84 attached to the underside of the rear portion 80 of the said base plate. A hinge 85 has a rearwardly disposed flange 86 affixed to the upper surface of the ski by screws or the like (not shown), and a movable flange 87 swingable from a forward position flat against the upper surface of the ski to a rearward position as shown in Fig. 11 wherein the latter flange overlies the first said flange with a slight gap between the two.

In the latter position of the flanges, the base plate is moved in a forward direction during closing of throw 73 to bring the lip 84 between the two flanges, which locks the swingable end 66 of the base plate to the ski (see also Fig. 13). Any attempted vertical movement is arrested by the movable flange 87 bearing against the underside 88 of the base plate. A catch 89 is provided to retain the latter flange in its said forward position when it is desired to permit the base plate to swing vertically about its pivoted end 67.

In use, the above-described binding is simple to operate. Using the apparatus shown in Fig. 1, the throw is open so that the base plate 10 is slideable to the rear and the ski boot can be placed on the ski, the toe of the boot being placed into the rear surface 62 of the block member 58. Tong member 36 is adjusted for the proper height to be aligned with the grooved heel of the boot and then wing bolt 43 is tightened to the desired pressure to hold the tong member in position. The throw 73 having been connected with the proper slot of the base plate, it is then closed to slide the base plate

forward thereby causing the arcuate portion or cavity **40** of the tong member to engage and press into the grooved heel. If additional tightness of the binding is required, or if it needs loosening to a slight degree, turnbuckles **30** and **31** can be adjusted as desired.

For walking or touring, the hooks **8** and **9** are disengaged from cables **22** and **23** respectively prior to closing the throw and tightening of the said turnbuckles, and the transverse strap **15** can be adjusted forward or backward along the ski to provide the appropriate tensioning on the ski boot heel as desired, the farther forward the strap is moved the greater the flexure or swinging of the base plate permitted relative to the ski during walking, and conversely, the farther rearward the strap is moved the less flexure permitted. The latter adjustment can be made at any time, even while the ski boot is bound to the ski.

For downhill skiing, the cables aforementioned are engaged with the respective hooks prior to closing the throw or clamping device, so that when the binding has been tightened, the base plate will be held firmly down against the surface of the ski.

When using the embodiment shown in Fig. 9, the throw or clamping device **73** is opened, i. e., the forward end **70** of the wire frame **69** is disengaged thereby and the said frame and base plate is moved to the rear, or to the left as viewed in Fig. 9. Assuming it is desired to adjust the ski for jumping, swingable flange **87** of hinge **85** is swung back into overlying relation to the fixed flange **86** (see also Fig. 11). At this point lip **84** of the base plate **63** is to the left and beyond the rear edge **90** of the said fixed flange.

The ski boot is placed on the ski, the toe being moved into engagement with the rearwardly extending projection **79** on the toe plate **74**. The heel-engaging means is properly adjusted as aforementioned for the first embodiment. Then the forward end **70** of the wire frame is placed over the proper lug **91** on the throw **73** and the latter is closed which pulls the wire frame **69** and base plate **63** forward, or to the right as viewed in Fig. 10 and moves the heel-engaging means into engagement with the heel as described. During this forward movement, the lip **84** is moved in between the hinge flanges **86** and **87**, thereby locking the base plate down against the ski to provide the firm binding of the ski boot to the ski which is necessary for jumping.

If on the other hand, it is desired to use the latter ski binding for touring, then with the frame and base plate in its position to the left before the throw is closed, the movable flange **87** is swung to its said forward position flat against the ski where it is clamped in such position by catch **89**. Thus, when the throw is closed, the lip **84** is not engaged by the said hinge flanges and vertical movement of the swingable end **66** is permitted.

While two particular embodiments of this invention have been described herein, it is apparent that certain changes may be made by those skilled in the art without departing from the spirit and scope of this invention.

I claim:

1. A ski binding comprising a flexible base plate longitudinally disposable along the top surface of a ski, a flattened guide sleeve affixable to said surface and adapted to slideably receive said base plate, means for releasably securing said plate to said ski at its own forward end, means for adjusting the flexure of the other end of said plate relative to said surface, heel-engaging means connected to said plate near said other end for holding the heel of a ski boot to said plate without impeding the release of said heel under any predetermined lateral pressure on the same, said latter means comprising a threaded post affixed to said base plate, a tong member having a pair of oppositely disposed plates joined at one end by a yoke, said plates having a pair of registered holes threadably engageable with said post, an arcuate portion on said yoke adapted to engage the grooved portion of a ski boot heel, and screw means connecting the said plates for deforming the latter relative to one another to fixedly position said tong member on said post against rotational movement below a preselectable lateral pressure on said heel-engaging member; toe securing means for releasably engaging the toe of said ski boot to hold the latter to the ski while forcing said heel back against said heel-engaging means with a predetermined pressure, said toe securing means comprising a block member disposable on the top surface of said sleeve, said block member having a rearwardly projecting surface adapted to receive the toe of said ski boot, and manually adjustable spring means for holding said block to said ski and for forcing said block rearwardly against said toe while permitting release of the same under a preselected pressure against said spring means.

2. In a safety ski binding, heel-engaging means for releasably engaging the grooved portion of a ski boot heel to hold said heel to the ski comprising a base member attached to said ski, a tong member having a pair of oppositely disposed plates joined at one end by a yoke, said plates having a pair of registered holes adapted to receive said base member, an arcuate portion on said yoke adapted to engage said grooved portion, and screw means connecting said plates for deforming the latter relative to one another to fixedly position said tong member axially and radially relative to said base member.

3. In a safety ski binding a flexible base plate longitudinally disposable along the top surface of a ski, adjustable means for slideably securing said base plate to said ski at its own forward end, means for adjusting the flexure of the other end of said plate relative to said surface, heel-engaging means connected to said plate near said other end for holding the heel of a ski boot to said plate without impeding the release of said heel under any predetermined lateral pressure on the same, said latter means comprising a threaded post affixed to said base plate, a tong member having a pair of oppositely disposed plates joined at one end by a yoke, said plates having a pair of registered holes threadably engageable with said post, an arcuate portion on said yoke adapted to engage the grooved portion of a ski boot heel, and screw means connecting the said plates for deforming the latter relative to one another to fixedly position said tong member on said post against rotational movement below a preselectable lateral pressure on said heel-engaging member.

4. A ski binding comprising a flexible base plate longitudinally disposable along the top surface of a ski, a flattened guide sleeve affixable to said surface and adapted to slideably receive said base plate, means for releasably securing said plate to said ski at its own forward end, a flat strap transversely disposable relative to said plate in overlying relationship to the same, said strap slideably securable to said ski at its ends and manually movable in a longitudinal direction relative to said plate to vary the flexure of the other end of said plate relative to said surface; heel-engaging means connected to said plate near said other end for releasably engaging the grooved portion of a ski boot heel to hold said heel to said plate without impeding the relase of said heel under any predetermined lateral pressure on the same, said heel-engaging means comprising a threaded post affixed to said base plate, a tong member having a pair of oppositely disposed plates joined at one end by a yoke, said plates having a pair of registered holes threadably engageable with said post, an arcuate portion on said yoke adapted to engage the grooved portion of a ski boot heel, and screw means connecting the said plates for deforming the latter relative to one another to fixedly position said tong member on said post, toe-securing means adjacent said forward end for releasably engaging the toe of said ski boot to hold the latter to the ski while forcing said heel back against said heel-engaging means with a pre-

determined pressure, and a second manually adjustable means for selecting the latter pressure.

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