April 18, 1967

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3,314,687

ADJUSTABLE SKI BINDING

Filed Oct. 15, 1965

3 Sheets-Sheet 1

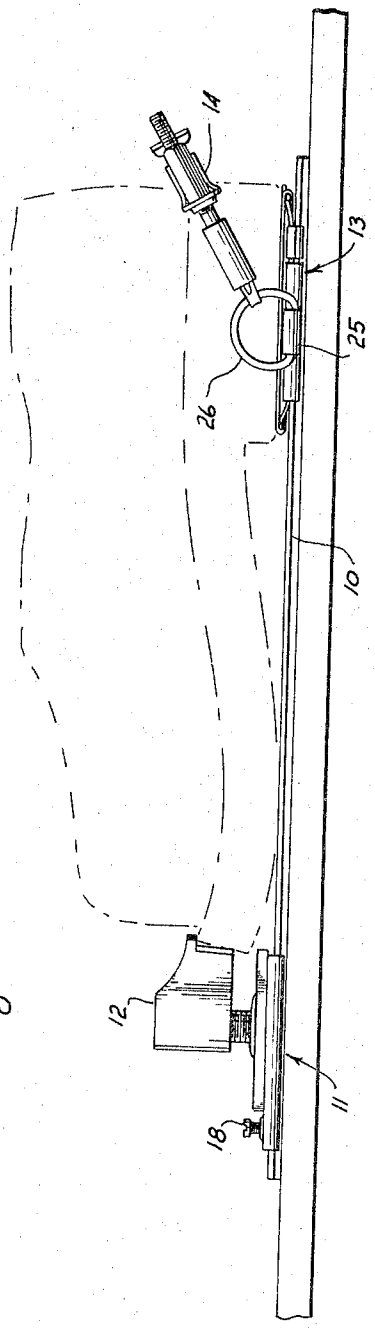


Fig. 1

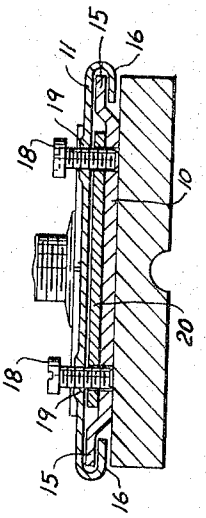


Fig. 2a

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3 Sheets-Sheet 2

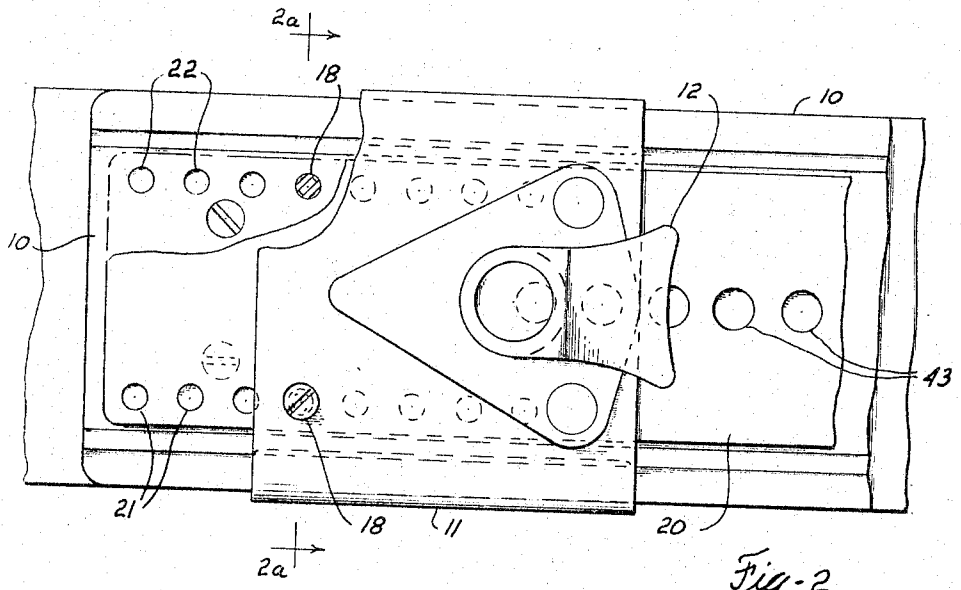


Fig-2

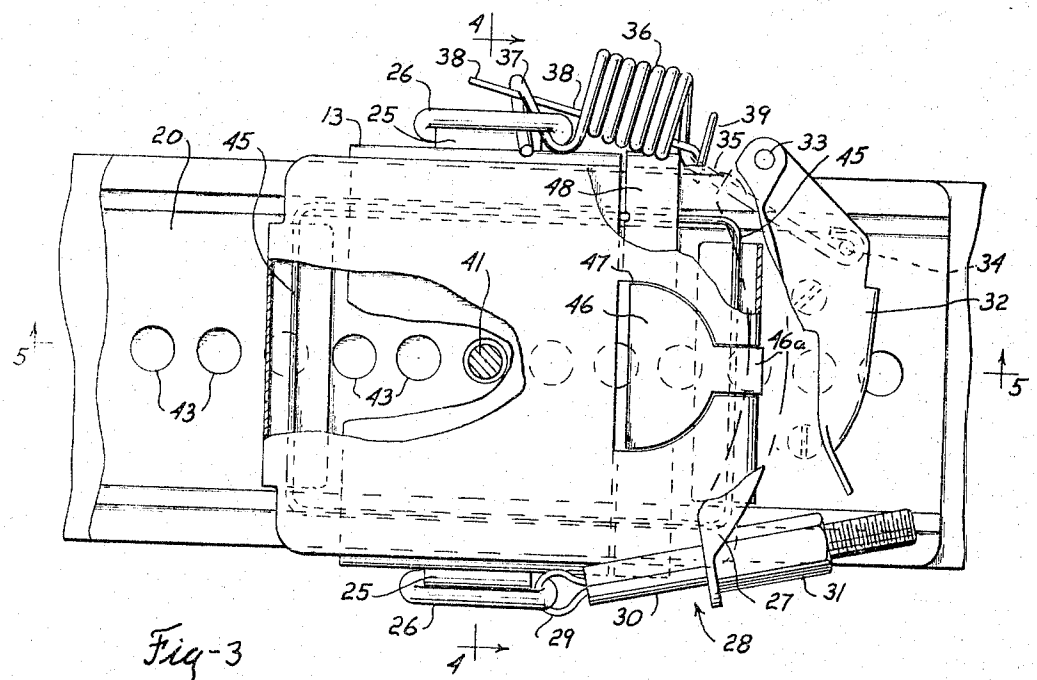


Fig-3

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3 Sheets-Sheet 3

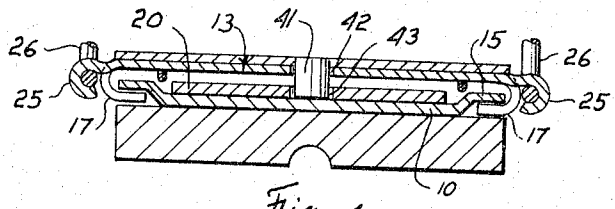


Fig. 4

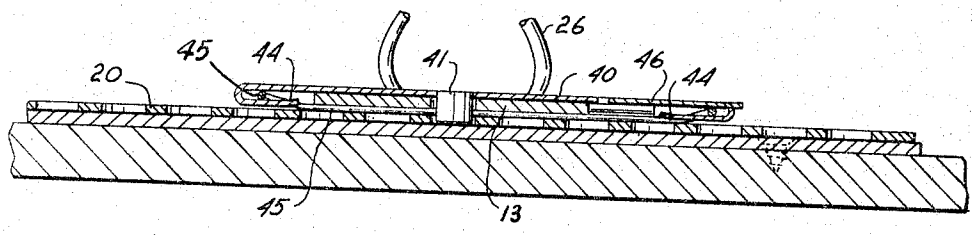


Fig. 5

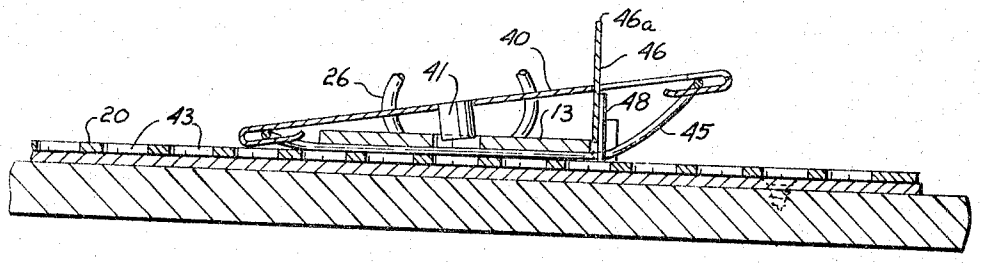


Fig. 6

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United States Patent Office 3,314,687 Patented Apr. 18, 1967

3,314,687

ADJUSTABLE SKI BINDING

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Filed Oct. 15, 1965, Ser. No. 496,433
8 Claims. (Cl. 280—11.35)

This invention relates to bindings for securing a skier's boot to a ski. This application is a continuation-in-part of my copending application No. 305,718, filed August 30, 1963, now Patent No. 3,248,124, issued April 26, 1966.

The bindings of the present invention are particularly adapted for use on snow skis. As set forth in my earlier filed copending application, the bindings of the type described therein offer a unique solution to many of the problems encountered with prior art equipment, namely the lack of the capability of being easily adjustable to meet varying snow conditions or different boot sizes. Moreover, such bindings could not be readily removed and remounted on other sets of skis. The need for a binding which possessed these qualities was particularly great in the ski rental business. The bindings disclosed therein have proved very effective in solving these problems since ski shop operators saved substantial amounts of time in fitting bindings for skiers. As used herein the term binding is generally intended to include all portions of the apparatus for securing the boot to the ski.

The present invention provides improved means for effecting the interchangeability and adjustability afforded by the bindings described and claimed in the aforementioned application.

Accordingly, an important object of this invention is the provision of improved apparatus for effecting adjustability of a ski binding to suit various ski conditions, boot sizes and the desires of a particular skier.

A further object of the invention is the provision of improvements in an arrangement of ski binding parts in order to make the binding rapidly interchangeable with different sets of skis.

A more specific object of the invention is the provision of an improved mechanism for rapidly adjusting the position of the heel gripping means in track type ski bindings of the general type disclosed in the aforesaid application.

A still further object of the invention is the provision of a ski binding which possesses the features of simplicity, dependability and durability essential in sporting goods equipment.

According to the invention, the foregoing and various other objects are achieved by a ski binding which includes a guide track secured to the upper surface of the ski; an elongated slide plate mounted on said track, a lock plate and a heel plate each slideably mounted on said track, said lock and heel plates each having guide means for retaining the plates on the track, a plurality of apertures spaced along said slide plate, at least one aperture on said track in axial alignment with a group of apertures on said slide plate, a vertically projecting lock pin carried by said lock plate, said pin being in engagement with selected apertures in the slide plate and in the track to secure the lock and slide plates in selected positions along the track and a vertically projecting pin on the heel plate, mounted for axial movement into and out of selected ones of said slide plate apertures.

The foregoing will become clearly apparent upon reference to the following detailed description and to the drawings in which:

FIGURE 1 is an elevational view of a binding constructed in accordance with the principles of the present invention;

FIGURE 2 is a plan view on an enlarged scale, of the toe gripping portions of the binding shown in FIGURE 1, with certain portions broken away for clarity;

FIGURE 2*a* is a sectional view taken along the lines 2*a*—2*a* of FIGURE 2;

FIGURE 3 is a plan view, with certain portions broken away for purposes of illustration, of the heel gripping portions of the binding of the present invention;

FIGURE 4 is a sectional view taken along lines 4—4 of FIGURE 3;

FIGURE 5 is a sectional view taken along lines 5—5 of FIGURE 3; and

FIGURE 6 is a sectional view taken along lines 5—5 with the positioning of parts being changed to illustrate one of the operating portions of the apparatus of the invention.

As viewed in FIGURE 1, the illustrative embodiment of the invention includes, generally, a guide track **10**; a locking plate **11** which supports a toe piece **12**; and a heel plate **13** (see also FIGURES 3 through 6) to which is connected a heel clamping means generally indicated at **14**.

Track **10** is preferably a channel shaped member, provided with guides or laterally extending flanges **15** which are spaced above the upper surface of the ski. Locking plate **11** and heel plate **13** are each provided with bent over laterally etxending guides **16** and **17** respectively (FIGURES 2*a* and 4). The locking plate and the heel plate guides fit under the track guides or flanges to restrain these members from separation from the track, while permitting sliding movement therealong.

A slide plate **20** rides on the track **10** in the space between the track flanges or guides **15**. The upper surface of the slide plate is preferably flush with or slightly below the upper surface of the flanges **15**, so that the heel and locking plates **11** and **13** will slide along the track out of engagement with the slide plate.

As viewed in FIGURES 2 and 2*a* locking plate **11** is provided with locking means which preferably comprise a pair of transversely spaced threaded pins or machine screws **18**. Screws **18** are threaded into threaded apertures **19** in the locking plate **11**.

Slide plate **20** is provided with a plurality of apertures **21** extending lengthwise of the plate. The apertures are placed in the plate in two side-by-side rows in axial alignment with the screws or pins **18**. At least one aperture **22**, and preferably a plurality, are located in the track **10** in axial alignment with, and preferably having the same spacing as, the apertures **21**. As will be evident from the drawings, especially FIGURE 2*a*, the locking pins **18** may be extended through pairs of aligned apertures in the slide plate **20** and the guide track **10** and when in that position, lock the toe piece, the slide plate and the track relative to one another.

As shown in FIGURE 3, heel plate **13** is provided with a pair of bent over ears **25**, on which are mounted a pair of D-rings **26**, as is clearly shown in FIGURE 3. A toggle operated heel gripping bar **27** is secured to one of the D-rings **26** by means of an eye-bolt **28** having an eye **29** connected to the ring **26**. The shank of the bolt passes through a hole in the bar **27**. Spacer **30** and a

nut **31** threaded on the shank of the eye bolt provide for limited adjustability of the heel bar **27**. A manually operable locking lever **32** is pivotally mounted on the bar by means of a pair of spaced apart aligned pins **33**, only one such pin being visible in FIGURE 3. The lever carries a pin **34** to which is connected a shank portion **35** of a coil spring **36**. The opposite end of the spring **36** is formed with a loop **37** spaced away from the base of the spring. A locking pin **38** has a looped portion **39** which is loosely connected to the shank **35** of the spring. The free end **38***a* of the pin **38** is passed through the loop **37**, forming a coupling which is connected to D-ring **26**. When the spring is stretched a predetermined amount, as described in my copending application Ser. No. 459,758, filed May 28, 1965, the end **38***a* of the pin **38** is pulled free of the loop **37**, and at this point the heel clamp bar releases the boot from the ski allowing for a free fall.

In order to lock the heel plate at different adjusted positions lengthwise of the ski, I mount a flat plate **40** on the heel plate for movement toward and away from a position in which it is flush with the heel plate **13**. The flat plate **40** carries a second locking pin **41** (see FIGURES 3–6). The pin **41** normally extends through an opening **42** in the heel plate and into a selected one of a plurality of apertures **43** disposed in a row on the slide plate **20**. Plate **40** is provided with bent over end portions **44**. A substantially rectangularly shaped spring loop **45**, is disposed beneath the heel plate **13** with its ends extending upwardly into the grooves formed by the bent over ends **44** of the plate **40**. The spring thus urges the plate **40** downwardly into the position in which the pin **41** rides in an aperture **43**.

In order to retract the pin **41** from the aperture in which it was previously inserted, I provide a second lever **46** (see FIGURE 3) which is pivotally mounted on the heel plate **13**. The lever **46** normally rests in a cutout **47** in the plate **40** so that its upper portion is flush with the surface of plate **40**. The lever **46** is provided with a camming plate or bar **48** which extends underneath the plate **40**.

To retract the pin **41**, the operator merely lifts the lever **46** by its end **46***a*. The camming bar **48** lifts the lever or plate **40** which removes pin **41** from an aperture in the slide plate, and in this position the heel plate is now freed for movement to different adjusted positions along the track. When the lever **46** is in the substantially upright position shown in FIGURE 6, it should be noted that it will remain in this position against the urging of the spring **45** until such time as the operator pushes it downwardly to return it to its normal position. With this arrangement, the heel plate can be moved to the desired adjusted position and when it is in the selected position the operator merely has to place a slight pressure on the handle **46** to release the pin **41** for downward movement.

In use, toe and heel plates **11** and **13** may be set in different adjusted positions on the slide plate **20**, according to the size of the skier's boot. Locking screws **18** are then adjusted so that they extend only through the slide plate **20**. The slide plate is then moved to any position lengthwise of the track, usually to a point where the ball of the foot is over the midpoint of the ski running surface but also to any other position in accordance with the skier's desires. At that point the pins **18** are further advanced into the holes in the track **10** and the binding is locked in adjusted position.

As in the case with the binding described in my copending application No. 305,718, the slide plate with the toe and heel plates and the boot attached may be simply and easily transferred to another channel member, which will function as a boot tree for storing boots. The boot with binding portions attached can thereafter be transferred to any other ski which already is equipped with a track.

If desired, it should be obvious that certain portions of the invention, notably the heel plate with its locking mechanism may be used with conventional toe pieces mounted directly on a ski. In such an installation, apertures would be provided in a piece of guide track or a piece of the slide plate secured directly on the guide track. Such an arrangement, of course, would not allow for adjusting the position of the boot lengthwise along the ski running surface.

The bindings of the invention are simple in construction and are durable and safe in operation. The interchangeability provided by the invention makes it possible to fit a binding on a ski in a matter of minutes and to thereafter make adjustments for boot sizes ranging from a small child's size to the largest adult size.

I claim:

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

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

a lock plate and a heel plate each slidably mounted on said track guide portions, said lock and heel plates each having guide portions complementary to the track guide portions for retaining said plates on the track;

an elongated side plate mounted on said track in the space between said track guide portions;

a plurality of apertures spaced along said side plate, said apertures extending lengthwise of the ski at least one aperture on said track located in axial alignment with some of the apertures on said slide plate;

a vertically projecting locking pin carried by said lock plate, said pin being engageable with selected apertures in said slide plate and said track to secure said lock plate and slide in selected positions along said track;

a second vertically projecting pin on said heel plate; and

means mounting said second pin for axial movement into seleced ones of said slide plate apertures to secure said heel plate to said track.

2. Apparatus according to claim **1** wherein the mounting means for said second pin includes a lever pivotally mounted on said heel plate, for moving said pin into and out of said selected slide plate apertures.

3. Apparatus according to claim **2** further including spring means urging said pin towards engagement with said slide plate apertures.

4. Apparatus according to claim **1** wherein said first mentioned locking pin is a screw having a threaded shank, and a hole in said lock plate having threads mated to the threads on said pin.

5. Apparatus according to claim **1** wherein said lock plate is adapted to carry a boot toe gripping piece.

6. Apparatus according to claim **1** wherein the upper surface of said slide plate is substantially flush with the upper surface of said track.

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

a flat plate having a series of apertures spaced lengthwise of the ski, laterally extending guides on each side of said plate, said guides and said flat plate adapted to be secured to the ski;

a heel plate slideably mounted on said flat plate, said heel plate having guide engaging portions for retaining said heel plate on the flat plate;

a downwardly extending pin for locking said heel plate with respect to said flat plate;

pin mounting means including a locking lever pivotally mounted on said heel plate for movement towards and away from engagement with said heel plate, said pin being mounted on said pivotally mounted lever,

an opening in said heel plate positioned to receive said pin, said pin being movable through said opening into selected ones of said apertures upon movement of said pivotally mounted lever towards said heel plate;

spring means on said pivotally mounted lever for biasing said lever downwardly; and

a second lever pivotally mounted on said heel plate, a camming ledge on said second lever for raising said first lever to retract said pin upon pivotal movement of said second lever.

8. Apparatus according to claim 7 wherein said second pivotally mounted lever is flush with said locking lever when the latter is in engagement with said heel plate.

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