Nov. 10, 1970 C. J. JEHLE ET AL 3,538,524

SKI BINDING

Filed Dec. 30, 1968 2 Sheets-Sheet 1

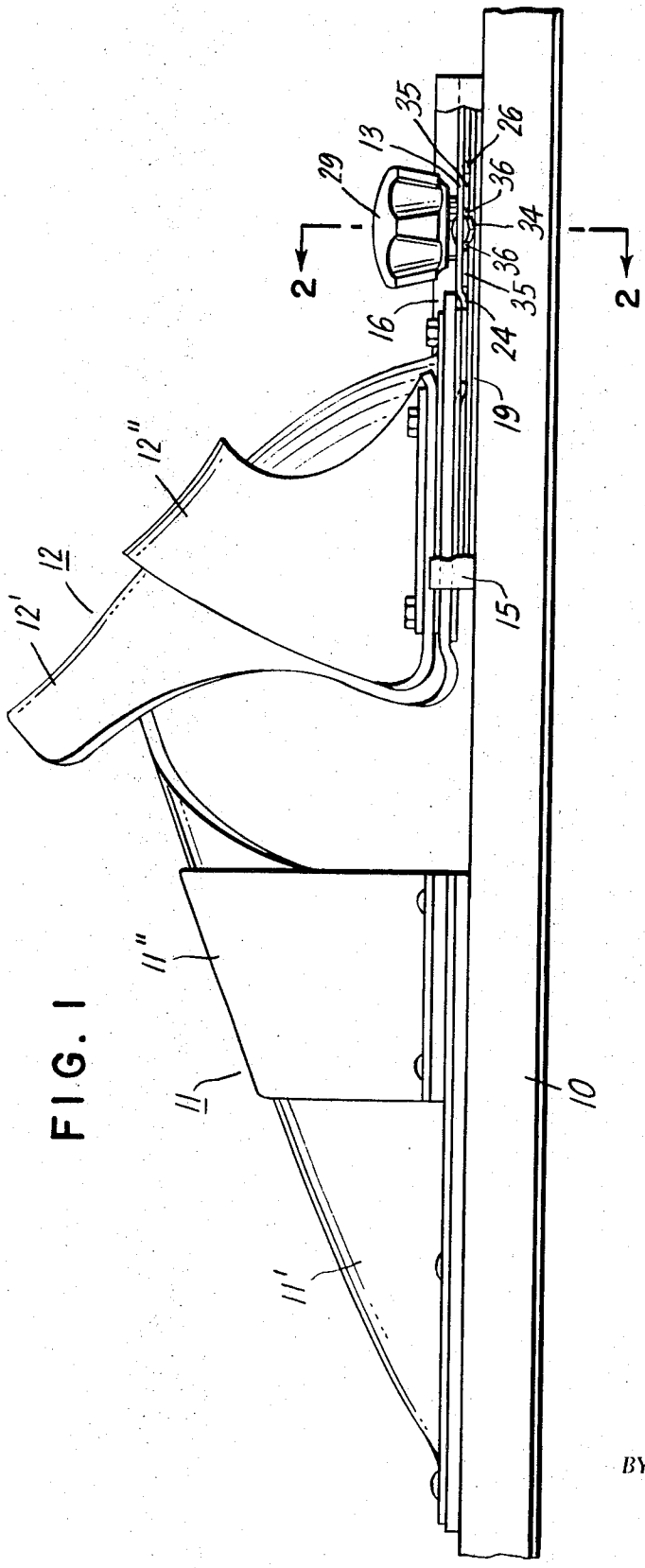


FIG. 1

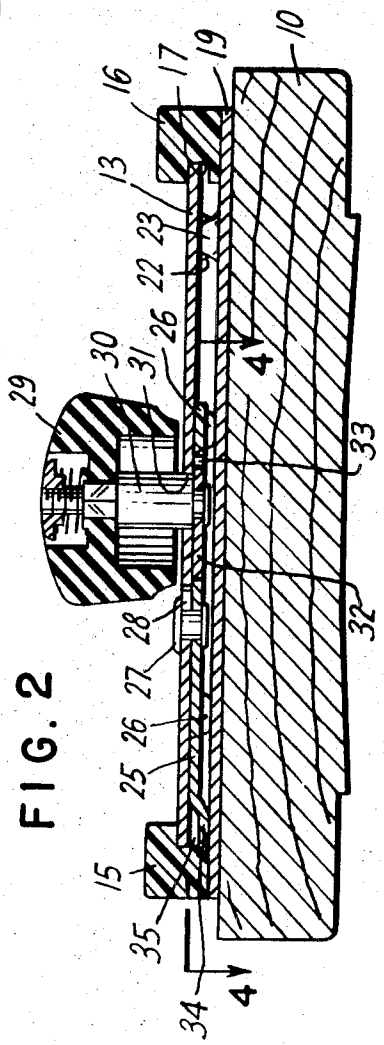


FIG. 2

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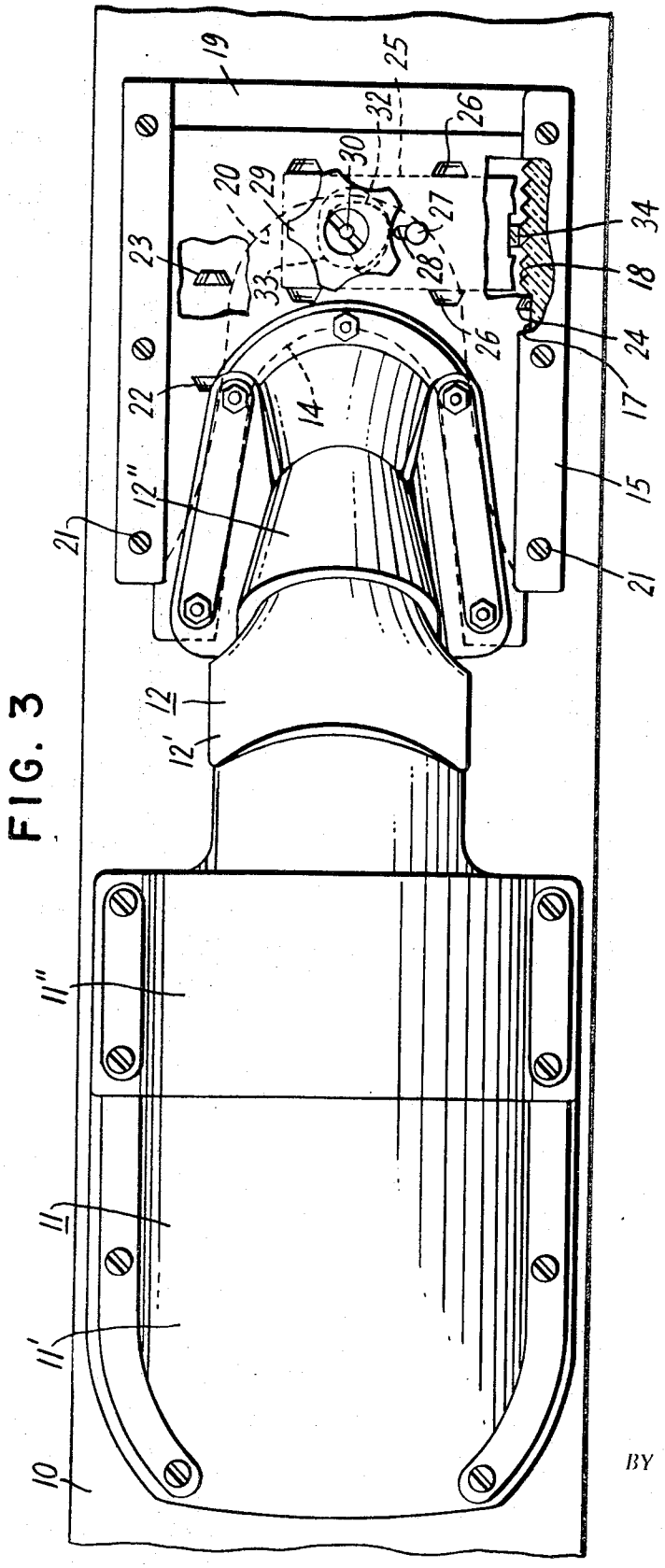


FIG. 3

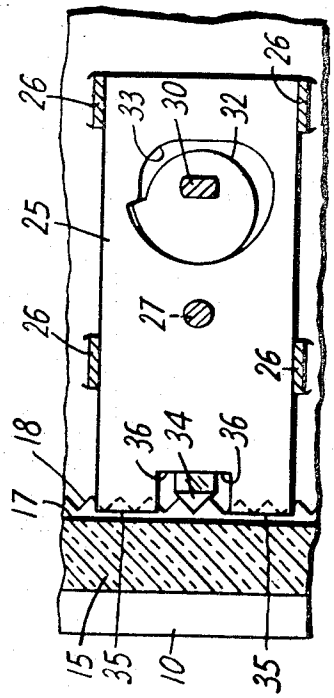


FIG. 4

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SKI BINDING

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Int. Cl. A63c 15/06
U.S. Cl. 9—310 6 Claims

ABSTRACT OF THE DISCLOSURE

The means for locking the adustable heel plate in set position comprises a transverse slide beneath the heel plate which has a tooth on it engagable with a row of teeth formed on one of the side guides for the heel plate. The transverse slide is moved by a rotary cam disposed in a cam notch formed in the transverse slide. The rotary cam is operated by a hand knob which is disposed above the heel plate and behind the foot heel engaging part mounted on the adustable heel plate.

This invention relates to a ski binding, and more particularly, to an improved adustable locking mechanism for a sports ski binding.

It is an object of this invention to provide a low cost and uncomplicated ski binding which has a minimum number of parts, can be quickly and conveniently operated with one hand, and is firm and positive acting with no likelihood of jamming or accidental unlocking.

Briefly, in the preferred form of the invention a water ski foot binding is illustrated having an adjustable heel plate which is locked in set position by a transverse slide mounted thereunder which is movable by a hand knob controlled cam to engage it with a row of teeth formed on one of the heel plate side guides.

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a broken away side elevation view of the preferred form of the invention;

FIG. 2 is an enlarged sectional view taken along the section line 2—2 of FIG. 1;

FIG. 3 is a broken away top plan view of the device; and

FIG. 4 is an enlarged sectional view taken along the section line 4—4 of FIG. 2.

Referring now particularly to the drawings, a water ski adjustable foot binding is illustrated comprising an elongated ski board **10**, a fixed forefoot engaging part **11**, and a heel engaging part **12**. The part **11** comprises a pair of rubber pieces **11'** and **11"** which are suitably fastened to the board **10**, and the part **12** comprises a pair of rubber pieces **12'** and **12"** which are fastened to an adjustable heel plate or slide member **13**. In other words, member **13** has the part **12** mounted thereon for adjustment towards and away from the part **11**.

Heel plate **13** is rectangular in exterior shape and has a cut out **14**, see FIG. 3, at its front end to give it a U-shaped configuration at its front end. The heel part **12** is mounted to the heel plate **13** along cutout **14** by suitable clamping means in a manner clearly understood by those skilled in the art.

The heel plate **13** is lengthwise movable between a pair of guide members **15** and **16**. Both guides **15** and **16** have a slot **17**, see FIG. 2, formed therein which is adapted to receive the opposite side edges of heel plate **13**. However, in addition thereto, the left hand guide **15** has a row of teeth **18** formed thereon along its slot **17** to lock the heel plate **13** in set position in a manner which will be described shortly.

The guides **15** and **16** preferably are constructed from plastic so that their slots **17** and teeth **18** can be readily integrally formed thereon by molding or the like. Positioned directly on the upper surface of the board **10** and beneath the heel plate **13** is another plate **19** which is also rectangular along its exterior sides but U-shaped at its front because of a cutout or notch **20** at its front end. The guides are positioned on top of the opposite side edges of plate **19** and guides **15**, **16** and plate **19** are fastened together and to the board **10** by suitable means such as wood screws **21**.

Stop means are provided for limiting rearward movement of heel plate **13**. The stop means comprises integrally and oppositively facing nibs **22** and **23** formed on the plates **13** and **19** respectively. The nib **22** is formed to project down and the nib **23** to project up. A downwardly projecting nib **24** is also formed on plate **13** along its left side edge. This is so that plate **13** will not rattel or slide loosely in the slot **17** of left guide **15** but in a snug fashion for a reason which will be more clear hereinafter.

The means for locking the heel plate or slide member **13** in set position comprises a transverse locking slide **25** mounted on and beneath the heel plate **13**. Locking slide **25** is rectangular in shape and is guided in a direction transverse or perpendicular to the lengthwise direction of the board **10** by nibs **26** integrally formed on the heel plate **13**. Nibs **26** project down and engage opposite side edges of the locking slide **25**. Locking slide **25** is mounted to the underside of heel plate **13** by a rivet **27** or other suitable means. Rivet **27** is aligned with a slot **28** formed in the plate **13** which extends in a transverse direction.

The locking slide **25** is moved to left or right by a hand knob **29**. Knob **29** is positioned above heel plate **13** behind the heel engaging part **12**. Rotation of knob clockwise moves locking slide to the left to set lock position, which is the position illustrated in the drawings. Opposite or counter clockwise rotation of knob **29** slides locking slide **25** to the right to unlock the heel plate **13**.

Knob **29** is connected to the upper end of a cam operating shaft **30**. The lower end of shaft **30** extends through an aligned aperture **31** in heel plate **13** in to a flat cam **32** to which it is connected at its lowermost end. Cam **32** and shaft **30** are fixed with respect to each other so that when knob **29** is rotated so is cam **32**. Shaft **30** of course is rotatably mounted in aperture **31** of heel plate **13**.

The cam **32** like the parts **13**, **19**, **25** is a thin and flat metallic plate piece. It is horizontally disposed within the flat plane of locking slide **25** within a cam notch **33** formed in locking slide **25**. The cam **32** and its notch **33** are contoured in the manner illustrated in the drawings and the cam **32** is eccentric with respect to the cam shaft **30**. When the cam **32** is rotated in either direction it rides on the edges of the cam notch **33** to move the locking slide either towards or away from the row of teeth **18** on the left guide **15**. The interaction between the cam **32** and edges of cam notch **33** is positive, and the same is true to the row of teeth **18** and a cooperative tooth or dog **34** on the left hand end of the locking slide **25** whereby when the parts are in the position illustrated in the drawings the heel plate **13** is firmly locked in set position with respect to the forefoot part **11**.

The tooth or dog **34** is integrally formed on that end of the locking slide **25** corresponding to the guide **15** which has the teeth **18** thereon. Tooth **34** is bent slightly in a down direction out of the flat plane of the locking slide **25** so as to be positioned opposite to the row of

teeth **18**. The snug nib **24** takes up any looseness between the left side of heel plate **13** and its locking slide **25** to maintain this relationship of the tooth **34** always being positioned opposite to the row of teeth **18**. The left hand end of locking plate **25** has corner ears **35** which project into slot **17** when the locking plate is in locking position. The tooth **34** is spaced from the ears **35** by a pair of notches **36**, and the tooth **34** interlocks with any two adjacent pairs of the row of teeth **18**. Therefore, the position of the heel plate **13** or its heel engaging part **12** can be adjusted incrementally along length of board **10** towards and away from the forefoot part **11**.

Since the locking mechanism or adjustable rear end portion of the ski binding has a minimum number of parts it is low cost and also fool proof or free from jamming. The parts are illustrated in their lock set position. To unlock the heel plate the knob **29**, and therefore the cam **32**, is rotated counterclockwise slightly over 180 degrees. Due to the shape of the cam **32** and cam notch **33** the locking slide **25** is positively moved left or right and once moved to locked or unlocked position cannot accidentally move to the other position except by intentional turning of the knob **29**. In addition, since only operation of the knob **29** is required to lock or unlock the heel plate **13** and since the knob **29** is in a readily accessible position behind the heel engaging part **12** the locking mechanism can be operated and adjustments made in a convenient and quick manner solely with one hand.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and that it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed:

1. In a sports ski comprising a ski board having a fixed forefoot engaging part and a movable heel engaging part which is adjustably movable with respect to said forefoot part, and means for locking said heel engaging part in set position with respect to said forefoot part, said locking means comprising a flat slide member on said board which is adapted to have said heel engaging part mounted thereon, a pair of laterally spaced side guides on said board for guiding said slide member in a direction lengthwise of said board, a movable flat locking slide mounted on the underside of said slide member, means on said slide member for guiding said locking slide in a direction transverse to said lengthwise direction, a cam notch formed in said locking slide, a flat cam disposed in said cam notch, a hand knob positioned above said slide member and being connected to said cam to rotate the same against the edges of said cam notch to slide said locking slide towards and away from one of said guides, and interlocking means formed on said one guide and the end of said locking slide corresponding to said one guide for locking said slide member in fixed position by actuation of said knob to cause said cam to slide said locking member towards said one guide to engage said interlocking means.

2. In a sports ski as in claim **1**, said slide member, locking slide, and cam comprising thin metallic plate parts, said cam being disposed in the flat plane of said locking slide, the means connecting said knob to said cam comprising a shaft eccentrically fixed at one of its ends to said cam and extending therefrom in a direction perpendicular to said slide member through an aligned aperture formed in said slide member, said knob being connected to the other end of said shaft and being positioned behind said heel engaging part.

3. In a sports ski as in claim **2**, said interlocking means comprising a row of teeth formed on said one guide, and a tooth formed on the end of said locking slide corresponding to said one guide, said locking slide tooth being engagable with any adjacent pair of said teeth to lock said heel engaging part in any one of incrementally different spaced positions with respect to said forefoot engaging part.

4. In a sports ski as in claim **3**, said pair of guides comprising a pair of elongated plastic members, said row of teeth being integrally formed on said one guide, both of said guides having a lengthwise extending slot formed therein which is adapted to receive opposite side edges of said slide member, said means on said slide member for guiding said locking slide comprising integral nibs formed on said slide member which are adapted to engage opposite side edges of said locking slide, said locking slide being mounted on the underside of said slide member by a rivet, said rivet extending through a slot formed in said slide member which extends in a direction transverse to said lengthwise direction, and stop means for limiting rearward movement of said heel engaging part with respect to said forefoot engaging part, said stop means comprising a pair of oppositively facing nibs formed on said board and the underside of said slide member which are adapted to engage each other at the limit of said rearward movement.

5. In a sports ski as in claim **4**, said slide member and said locking slide having a rectangular exterior configuration, a cutout in the front portion of said slide member to give it a U-shaped form, said locking slide being positioned beneath the rear portion of said slide member, and said heel engaging part being mounted on said slide member along the edges of said cutout.

6. In a sports ski as in claim **5**, a thin flat metallic plate mounted directly on said board, said plate having a generally U-shaped configuration and being positioned beneath said slide member and its locking slide and cam, and the stop nib which is engagable with the stop nib formed on said slide member being integrally formed on said plate, said plate being rectangular in external configuration, said pair of guides being disposed along opposite sides of said plate, and fastening means extending through said guides and plate to fix the same to said board.

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