Feb. 18, 1958 J. S. WAGNER 2,823,397

SKI BINDING

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Fig:1.

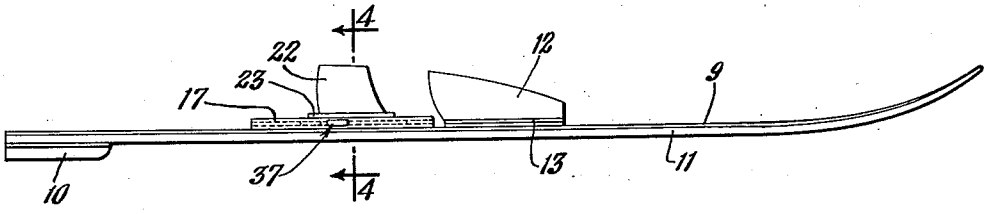


Fig:2.

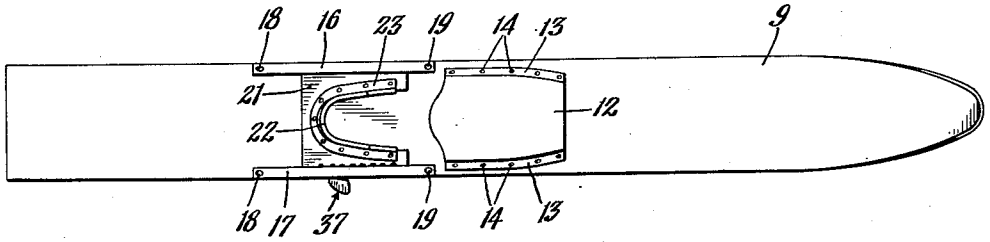


Fig:3.

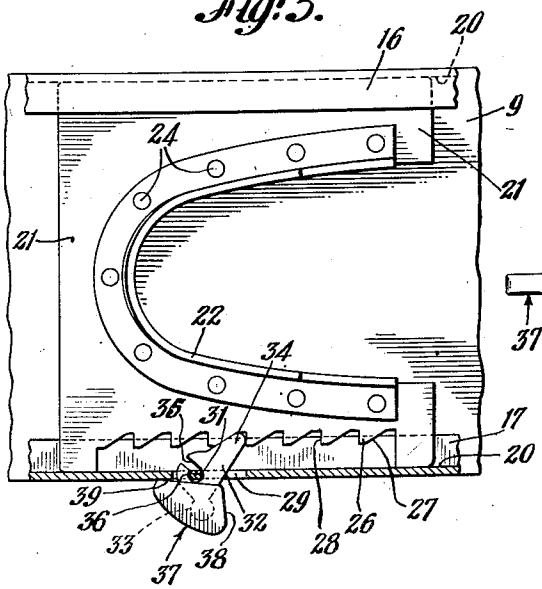
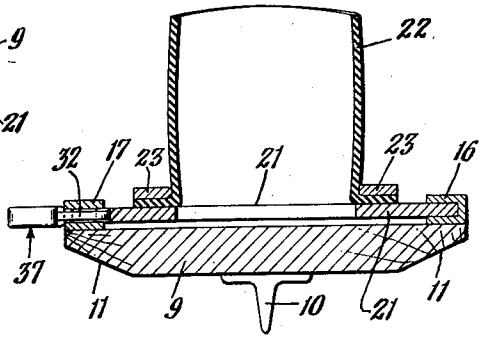


Fig:4.



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SKI BINDING

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5 Claims. (Cl. 9—21)

This invention pertains to improvements in skis and more particularly to a water ski binding for supporting and retaining the foot of a wearer.

The binding elements for supporting the foot of a wearer of water skis must, of necessity, be so constructed as to firmly support and retain the foot of the wearer, but also capable of being quickly and easily disengaged from the foot in case of emergency. Due to the nature of the use of water skis, it is also highly desirable that the components thereof, and particularly those of the binding, be kept to a minimum in order to avoid excessive weight and that there be no metallic protuberances which might tend to injure the wearer while the skis are being worn.

Accordingly, it is an object of the present invention to provide a water ski having a binding which is freely adjustable to the foot of the wearer.

It is a further object of the invention to provide a binding which may be locked about the foot to support and retain the same firmly in position during use, but which may be easily and quickly unlocked to release the foot when desired.

It is still another object of the invention to provide a ski binding comprising a minimum of components which are free from any projecting metallic elements which might injure the wearer.

In accordance with the foregoing objects, a preferred embodiment of the present invention comprises a ski provided with a flexible vamp portion or toe-piece rigidly secured to an upper surface of the ski and having a flexible heel support mounted upon a rack plate which is slidably movable upon the upper surface of the ski rearwardly of the vamp. The rack plate is provided with a series of ratchet teeth which are engageable with a pivoted pawl. Engagement of the teeth and the pawl permit movement of the rack plate and the associated heel support in the direction of the vamp but prevent movement of the rack plate and heel support in the opposite direction. The pawl is provided with a handle portion projecting horizontally from the ski and about which is mounted a resiliently deformable cap. Manual pressure exerted by the wearer upon the cap deforms the same and permits disengagement of the pawl and the teeth whereby the rack plate and heel support may be retracted and the foot of the wearer freed from the binding.

The novel features of the invention may be readily ascertained by reference to the following description and drawings wherein:

Fig. 1 is a side elevational view of a ski provided with the vamp, heel support and disengaging means of the invention;

Fig. 2 is a top plan view of the ski and associated binding illustrated in Fig. 1;

Fig. 3 is a top plan view, partially in cross-section, of the rack plate, heel support and disengaging means, and

Fig. 4 is a cross-sectional elevation taken along line 4—4 of Fig. 1.

Referring now to the drawings and more particularly

to Figs. 2 and 4, the numeral 9 denotes a ski, which, as illustrated in Fig. 4, may be formed of wood, provided with a stabilizing rudder 10 and bevel surfaces 11. The bevel configuration illustrated in Fig. 4 is desirable in a water ski in eliminating skidding and facilitating response on turns. On straight runs the bevel configuration lends stability to the ski and results in a smoother ride. The ski 9 has secured to the upper surface thereof a vamp or toe-piece 12 for supporting and retaining the front portion of the foot of the wearer. The vamp 12 is constructed of a flexible material such as cloth, rubber, plastic or the like, and is secured to the ski 9 by means of fastening plates 13 and screws 14. As illustrated in Figs. 1 and 2, the vamp portion 12 has a suitable configuration to fit the foot of the wearer.

A pair of guide rails 16 and 17 are secured to the upper surface of the ski 9 near the edges thereof and rearwardly of the vamp 12. The guide rails securing means may conveniently be in the form of screws 18 and 19. As best illustrated in Figs. 3 and 4, the guide rails 16 and 17 are provided with slots 20 extending longitudinally of the guide rails and opening inwardly of the ski.

There is provided a rack plate 21 which may be constructed of a suitably rigid material and which is slidably mounted within the slots 20 of the guide rails 16 and 17. A heel support member 22 is secured to the upper surface of the rack plate 21 by any suitable means such as a curved pressure plate 23 and screws 24. The heel support 22 is preferably formed of a suitable flexible material similar to that used in the construction of the vamp 12.

The longitudinal movement of the rack plate and the associated heel support 22 is limited by the screws 18 at the rearward extremity of movement of the rack plate 21 and by the screws 19 at the forward extremity of movement. The freedom of movement of the rack plate 21 and the heel support 22 is further restricted by means of a pawl and rack arrangement described herein below.

The rack plate 21 is provided, on one edge thereof, with a series of ratchet teeth 26. Each of the teeth 26 is provided with a surface 27 which is inclined outwardly and rearwardly of the plate 21 and a vertical surface 28 extending normal to the direction of movement of the plate 21. The guide rail 17 is provided with an aperture 29 communicating with the slot 20 in the rail 17 and a pivot pin 31 extending within the aperture 29. This arrangement may be conveniently formed by punching or cutting two separate adjacent apertures in the guide rail whereby the wall of the guide rail separating the two apertures constitutes the pivot pin 31.

In accordance with the invention, there is provided a pawl generally denoted by the numeral 32 and having a first or handle portion 33 and a second or tooth engaging portion 34. The pawl 32 is also provided with a slot 35 and a generally circular pivot surface 36 whereby the pawl may be inserted into the aperture 29 and pivotally mounted about the pivot pin 31 with the first portion 33 projecting outwardly of the guide rail 17 and the second portion 34 projecting inwardly thereof into engagement with the ratchet teeth 26. A cap member denoted generally by the numeral 37 is mounted about the first or handle portion 33 of the pawl 32 and is provided with a flat surface 38 and an elongated bearing portion 39 for engagement with the guide rail 17. The cap 37 is constructed of a resiliently deformable material such as rubber, neoprene or the like.

The pawl 32 is normally engaged with the teeth 26 whereby, when a forwardly directed force is applied to the rack plate 21 or to the heel support 22, the second portion 34 of the pawl 32 is pushed outwardly in a sliding movement by the inclined surfaces 27 of the teeth 26. This permits the heel support 22 to be moved toward the vamp 12 to firmly support and retain the foot of the

wearer. However, engagement of the second portion 34 of the pawl 32 with the vertically extending surfaces 28 of the teeth 26 prevents movement of the heel support in the opposite direction, and thereby assures against undesired loosening or release of the support of the wearer's foot by the binding. The heel support 22 may be disengaged from the foot of the wearer by the exertion of manual pressure upon the surface 38 of the cap 37, whereby the bearing portion 39 of the cap is forced against the wall of the guide rail 17 thereby deforming the cap 37 and disengaging the pawl from the teeth 26, whereupon a rearwardly directed pressure exerted upon the heel support 22 effects a corresponding movement of the heel support 22 and the rack plate 21.

It will be seen that a water ski which incorporates the foregoing novel features constitutes a decided improvement over the skis known to the prior art. Thus, skis constructed in accordance with the present invention are economically manufactured from a minimum of essential components and have the added advantages of being light in weight, easily engaged with and disengaged from the foot of the wearer, and presenting no undesirable projections which could injure the wearer or another person during the use of the skis. The only portion of the binding mechanism, aside from the flexible heel support and vamp, which projects any substantial distance from the ski is the cap 37 which, being formed of a relatively soft and deformable material, is incapable of inflicting injury. The invention possesses the added advantage of having few movable parts which are susceptible to wear and consequent breakage. Thus, there are no springs or complicated locking mechanisms to effect and hold the engagement of the pawl and the rack. Instead, advantage is taken of the natural resiliency of the cap 37 to achieve this object. These advantages of economy, safety, ease of operation, and durability represent decided improvements.

It is to be understood that the foregoing description is merely illustrative of the principles of the invention and that modifications within the capacity of one skilled in the art are to be included within the scope of the invention.

What is claimed is:

1. In a ski, a flexible vamp secured to an upper surface of the ski, a toothed rack plate slidably mounted on the ski rearwardly of the vamp, a flexible heel support secured to the rack plate, a pawl pivotally mounted on the ski and detachably engageable with the rack plate, and resiliently deformable locking means to hold said pawl and said rack plate in engagement, whereby deformation of said locking means permits disengagement of said pawl and said rack plate.

2. In a ski, a binding for quick disengagement of the foot of a wearer comprising a flexible vamp secured to the ski, a pair of slotted guide rails secured to the ski rearwardly of the vamp, one of said rails being provided with an aperture interconnecting with the slot in said one rail, a rack plate slidably mounted in said slots, a flexible heel support secured to said rack plate, a series of ratchet teeth on one edge of said rack plate, a pawl pivotally mounted on said one rail and extending through said aperture, said pawl having one extremity thereof engageable with said teeth, whereby movement of said rack plate is restricted to movement in the direction of said vamp, and a resiliently deformable cap mounted about the other extremity of said pawl whereby deformation

of said cap disengages said pawl and said teeth and permits said rack plate to be moved away from said vamp for disengagement of the foot of a wearer from the binding.

3. A water ski comprising a base of the type having a beveled bottom surface, a flexible vamp secured to an upper surface of the base, a pair of slotted guide rails secured to the upper surface of the base rearwardly of the vamp, a toothed rack plate slidably mounted in the slots of said guide rails, a flexible heel support secured to said rack plate, a pawl pivotally mounted on one of said guide rails and having a first portion extending outwardly of said one guide rail and a second portion extending through an aperture in said one guide rail and inwardly thereof, and a resiliently deformable cap secured to said first portion of the pawl and bearing against said one guide rail to hold said second portion of said pawl in engagement with said toothed rack plate whereby said cap may be forcibly pressed against said one guide rail to deform the cap and permit disengagement of the pawl and the toothed rack plate.

4. In a water ski, a flexible vamp fixed to an upper surface of the ski, a pair of guide rails fixed to the ski rearwardly of the vamp and adjacent the edges of the ski, each of said guide rails being provided with a slot extending longitudinally of said guide rails and opening inwardly of the ski, one of said guide rails being further provided with an aperture communicating with the slot therein, a pivot pin extending within said aperture, a rack plate slidably mounted in said slots, means to limit the movement of said rack plate, a series of ratchet teeth on one edge of said rack plate adjacent the apertured guide rail, a flexible heel support secured to said rack plate, a pawl pivotally mounted about said pivot pin and having a first portion thereof extending outwardly of said aperture and a second portion thereof extending through said aperture and detachably engageable with said teeth thereby permitting said rack plate to be moved toward said vamp but preventing movement of said rack plate in the opposite direction, and a resilient cap mounted about said first portion of said pawl whereby a rearwardly directed force exerted on said cap deforms said cap and permits said pawl to be disengaged from said teeth thereby permitting said rack plate to be moved in a direction away from said vamp.

5. In a ski, a vamp secured to said ski, a toothed rack plate slidably mounted on said ski rearwardly of said vamp, a heel support secured to said rack plate, an elongated pawl, means to pivotally mount said pawl adjacent the teeth of said rack plate, and a resiliently deformable cap mounted about one extremity of said pawl and having a portion thereof bearing against the pawl-supporting means to hold said pawl in engagement with said teeth until said cap is deformed whereupon said pawl may be disengaged from said teeth to permit movement of said heel support toward and away from said vamp.

References Cited in the file of this patent

UNITED STATES PATENTS

687,620	Goodwin	Nov. 26, 1901
1,092,518	Brooks	Apr. 7, 1914
2,728,927	Hargett	Jan. 3, 1956
2,754,526	Bridges	July 17, 1956