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FRONT JAW SAFETY SKI BINDING

Filed April 19, 1968

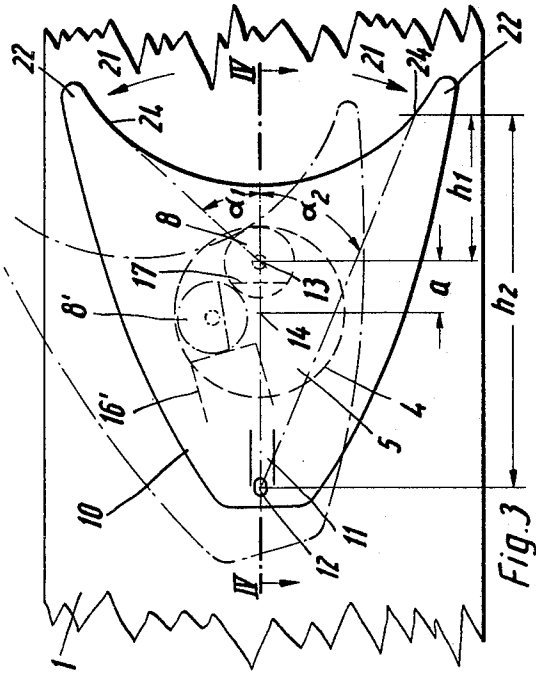



Fig. 3

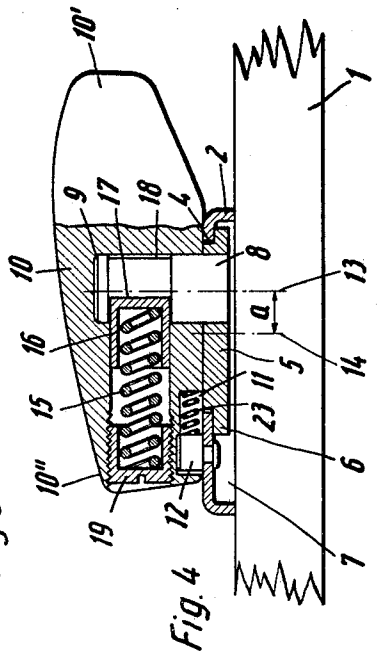



Fig. 4

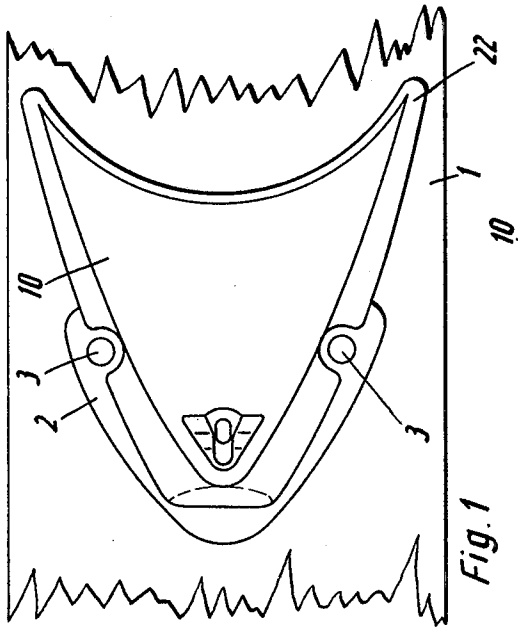



Fig. 1

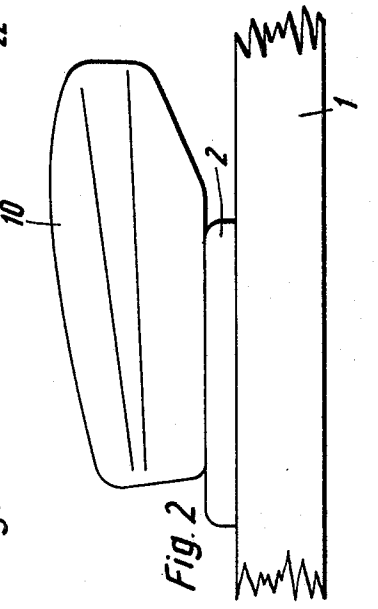



Fig. 2

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# FRONT JAW SAFETY SKI BINDING

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## ABSTRACT OF THE DISCLOSURE

Safety binding for ski made as a front cheek with a housing supporting the sole catch which swings laterally in a horizontal plane to release against spring bias, where a vertical pivot axis is rotatably mounted on a carrier member upon a base and eccentrically with respect to the pivot of the carrier member and where the housing is furthermore slidable longitudinally of the ski by guide means ahead of the pivot of the carrier member, which means prevents transverse movemennt of the forward end of the housing.

## BACKGROUND OF THE INVENTION

The invention relates to safety bindings for skis. More in particular, the invention relates to a safety binding for skis of the type that is in the form of a front cheek and which has a housing that carries the sole catch and which under excessive load moves pivotally in a horizontal plane about a vertically disposed axis against a latch or a biasing spring. For this purpose it is known to constitute the pivot axis in the manner of a bolt which is rigidly connected with the base plate. This bolt has a flat surface that is engaged by a spring under suitable pressure. This type of device has certain shortcomings. Considerable spring pressure is required in order to provide the counter pressure against the torsional forces or load. The sole retainer or catch is essentially merely swung to one side and hardly yields in the direction longitudinally of the ski. Between the start of the release movement of the boot and its final release a point of dead center must be overcome, unless the sole catch is suitably curved toward the outside. That, however, involves the consequence that the boot is only retained at points.

Furthermore a front cheek or jaw construction is known having a double pivot joint. While here the sole catch yields on release in the direction longitudinally of the ski, this system is only capable of functioning when the boot is pressed against the sole catch with sufficient pressure. If this pressure drops, for example due to setting the heel tensioner below a predetermined value, then the support becomes unstable and the sole catch swings out in responese to even the slightest transverse load on the point of the boot, i.e., before the torsional load of the boot has reached the safety limit. Otherwise it is necessary to provide either two sole catches which act obliquely on the point of the boot, or a separate latching means. This raises the cost of the ski binding considerably, and besides it introduces a point of dead center which must be overcome before the release can take place. In addition to this, such front cheeks or jaws are very rigid and unelastic in operation.

## SUMMARY OF THE INVENTION

It is an object of the invention to provide a front cheek or jaw which, while eliminating the foregoing shortcomings, affords with simple structural means, that the sole catch swings to the side in the event of torsion falls, while simultaneously it also displaces itself forwardly longitudinally of the ski.



Accordingly the invention provides, above all, that the vertical pivot axis is disposed on a supporting member rotatable on or in the base plate eccentrically with respect to the pivot point thereof and that furthermore the housing is guided displaceably longitudinally of the ski with respect to the base plate at a location ahead of the supporting member, while there it is latched against displacement transversely of the ski. After overcoming the pressure of a retaining spring, the force of which may be adjustable, the housing swings to the side with its end that carries the sole catch as a result of the eccentric disposition of the pivot avis on the rotatable supporting member. Simultaneously, however, it yields forwardly due to its displaceable mounting. The sole catch is preferably rigidly mounted relative to the housing, or it may be cast in one piece with it as a unit. This not only reduces the manufacturing cost but also affords greater stability than the pivotable arrangement of the sole catch in the double joint arrangement in accordance with the prior art. In addition to this the sole catches must be manually moved into the fitting position prior to insertion of the point of the boot, which is particularly difficult if the binding is coated with ice or snow. This shortcoming is also overcome by the invention because the housing is firmly held by a spring when the boot is inserted and the sole catch is rigidly secured on the housing as explained above. Furthermore the pivot point of the housing is displaceable or may be disposed far to the front toward its point. In this manner a relatively large space is provided between the point of the boot and this pivot point, which favorably affects the release action. It is also essential that these functional advantages are obtained with an arrangement which is structurally very simple and where, moreover, all other components can be encompassed by the housing in a manner to safeguard against ice formation. When a suitably constructed retaining spring is used, a front cheek of this type will not release immediately as a sudden thrust occurs, but it will first yield with elastic resiliency. This is very essential according to the newest discoveries in the art of ski bindings. Besides, it is not necessary to overcome a dead point in the sense that prior to release the binding must first be pressed back and is only then made free.

## BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention will become apparent from the following description of an embodiment with reference to the accompanying drawings, in which

FIG. 1 is a top plan view of a front cheek constructed in accordance with the invention,

FIG. 2 is a side view of the device in accordance with FIG. 1,

FIG. 3 is a further top view showing the cheek schematically in two different positions, and

FIG. 4 is a section taken along line IV—IV in FIG. 3.

## DESCRIPTION OF A PREFERRED EMBODIMENT

A base plate or support **2**, is secured by means of screws **3** to the ski **1**. If desired, a further plate (not shown) could be disposed between the plate or support **2** and the ski. This could be the forward extension of a standing plate threadedly mounted on the ski and extending over the full length of the boot.

The support **2** is provided with a circular aperture **4** in which the disk-shaped carrier element **5** is rotatably mounted. The carrier element is protected against being lifted from the base by retaining means in the form of outwardly extending projections, such as an annular flange **6** which extends into the space **7** between the sup-

port **2** and the surface of the ski and under the support **2**. The pivot axis which may be in the form of a round bolt **8** is secured to the carrier element **5**, for example by welding. The bolt **8** is rotatably disposed in a bore **9** of housing **10** and cooperates with the spring and latch means in a manner described more in detail hereinafter.

The rearward end **10'** of the housing **10** is in the form of a sole catch, or a sole catch is provided there which may be threadedly mounted in a manner to be adjustable in height. The displaceable mounting means mentioned hereinabove is disposed in the forward part **10''** of the housing. In the embodiment illustrated this is in the form of a guiding slot **11** extending longitudinally of the ski in the bottom of the housing and a pin **12** on the support **2** engaging the slot. It would of course also be possible to provide the slot on the support **2** and the pin on the housing, or to provide a different form of guiding means.

The center axis **13** of the bolt **8** is arranged on the carrier element **5** at a distance *a* from the axis of rotation **14** of element **5**. In the position of operation (retaining the boot) it is behind the axis of rotation **14** with respect to the longitudinal extent of the ski. Preferably the bolt **8** is disposed in the rearward part of the housing. The guiding groove or slot **11** and the pin **12**, however, are ahead of the axis of rotation **14** with respect to the longitudinal extent of the ski.

The aforementioned components cooperate in a manner similar to a crank drive, in which connection the housing constitutes the connecting rod and the distance *a* of the carrier element **5** of the crank. The forward end of the "connecting rod" thus can yield longitudinally of the ski, but is locked against displacement transversely thereof. The rearward end of the "connecting rod" and thus the sole catch can make a rotary movement about axis **14** and simultaneously displace itself forwardly. Thus the upper "dead point" of the "crank shaft" constitutes the operative position.

The latching or spring device in this embodiment comprises a spring **15** which is biased by way of a spring socket **16** against a flat surface **17** on the bolt **8**. In the operating position this flat surface is disposed transversely of the longitudinal extent of the ski. Preferably this flat surface is located in an annular latching groove **18** of the bolt, so that as the spring socket **16** enters the groove **18** the housing is latched against rising from the bolt. The forward end of the spring **15** rest against a set screw **19** in the form of a socket in the forward end **10''** of the housing. By means of the screw **19** the pressure of the spring can be adjusted as required.

In operation the spring **15** acts to provide for flush engagement between the front end of the spring socket **16** and the flat surface **17**, i.e., to establish the position of operation illustrated in FIG. 3. It is evident that the latching into operating position could also be effected in a different manner without departing from the spirit of the invention. For example, in lieu of, or in addition to, an elastic retaining spring, a different latch could be provided to maintain the housing in operative position. When a torsional force arises (arrow **21**, FIG. 3), the spring **15** is compressed and the housing is swung into the position indicated in dot and dash lines. The spring socket then assumes the position **16'** as indicated by the dash lines. It can be seen the housing has now effected a movement to the side as well as a forward movement. The construction of the front cheek in accordance with the principle of a crank mechanism permits that in spite of a rigid connection of the sole catch with the housing, in the position of operation, the sole catch can grip a very large portion of the sole laterally of the boot (FIG. 3, **22**) without this lateral span interfering with the freeing of the boot when the release action occurs.

The return of the housing into operating position after release can be readily effected manually. As soon as a certain angular position is passed between the flattened surface **17** and the front end of the spring socket, the further return setting takes place automatically under the pressure of the spring **15**. If it is desired, the arrangement may also be made in a manner that during release this angular position is not exceeded, so that upon freeing of the boot the aforementioned return operation takes place automatically. Instead it would also be possible to provide return spring betwen the housing, on the one hand, and the base plate or support on the other hand, which is forwardly compressed as the housing is displaced. This is indicated in FIG. 4 as a compression spring **23** which is arranged in the guide slot **11** between the rearward end and the guide pin **12**.

Owing to the transverse support of the forward end **10** of the housing by means of the pin **12** and due to the retaining force of spring **15**, the entire device is solidly retained in operating position. Besides, the arrangement provides favorable leverage advantages for retaining the binding which result in lower counter forces of the spring and therefore a lighter form of construction. As already mentioned, the entire counter torsion force had to be provided at the flattened surface in the known bindings of the prior art. There the lever $h1$ between the force application point **24** of the boot on the sole retainer and the center point of the bolt **8** was relatively short, so that the angle $\alpha 1$ between the longitudinal extent of the ski and a line drawn from the center point of the bolt **8** to the engagement point **24** of the boot became correspondingly large. This resulted during release in that first the boot had to be pressed back a certain amount until the dead point was overcome.

In the binding in accordance with the invention, however, the housing swings about the pin **12**. The lever arm $h2$ thus created is essentially longer than the lever arm $h1$ in the known binding. In this manner the angle defined above which is now identified as $\alpha 2$, become essentially smaller than the angle $\alpha 1$, so that practically no dead point has to be overcome. In other words, the entire length of the housing is now available as a release lever. Thus a relatively short and compact form of construction is possible. In addition the pin **12** forms a counter bearing which intercepts the essential part of the torsion moments that arise.

Having now described my invention with reference to the embodiment illustrated in the drawings, what I desire to protect by Letters Patent of the United States is set forth in the appended claims.

I claim:

**1.** Safety binding for ski constructed in the manner of a housing having a front cheek arranged to unlatch in a horizontal plane about a generally vertical pivot, said binding comprising a rotatably mounted carrier member supporting a vertically disposed pivot member arranged on said carrier member for eccentric movement about the axis of rotation of said carrier member, said housing having a bore disposed around said pivot member on one side of the axis of rotation of said carrier member remote from the forward end of the binding, interengaging guide means disposed on the other side of said axis of rotation proximate the forward end of the binding comprising a stationary element and a movable element permtting sliding movement of said housing longitudinally of the ski and opposing movement transversely of the ski.

**2.** Safety binding in accordance with claim **1**, where said pivot member is a bolt secured to said carrier member.

**3.** Safety binding in accordance with claim **2** were said bolt is of generally cylindrical shape and welded to said carrier member.

**4.** Safety binding in accordance with claim **2**, where said bolt has a recessed portion intermediate its ends presenting a flat surface, a spring extends between said flat surface and the forward part of said housing and a spring socket receiving one end of said spring is in engage-

ment with said flat surface for the latched operative condition of said binding.

5. Safety binding in accordance with claim 4, where said bolt has a circumferential groove adapted to receive said spring socket as a latch when disengaged from said flat surface.

6. Safety binding in accordance with claim 2, including a base and a recess in said base having an aperture adapted to receive said carrier member and said bolt, said carrier member being in the form of a disk.

7. Safety binding in accordance with claim 6, where a space is provided below said base and said carrier member has retaining means projecting below said base.

8. Safety binding in accordance with claim 3, where said stationary element is a pin or the like supported on said base and said movable element is a guiding slot provided in said housing.

9. Safety binding in accordance with claim 8, comprising a compressible spring mounted in said guiding slot between said base and said housing adapted to yield in the direction of the forward end of said housing.



10. Safety binding in accordance with claim 9, where said compressible spring is disposed between the rearward end of said guiding slot and said pin or the like.

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