

Oct. 15, 1963

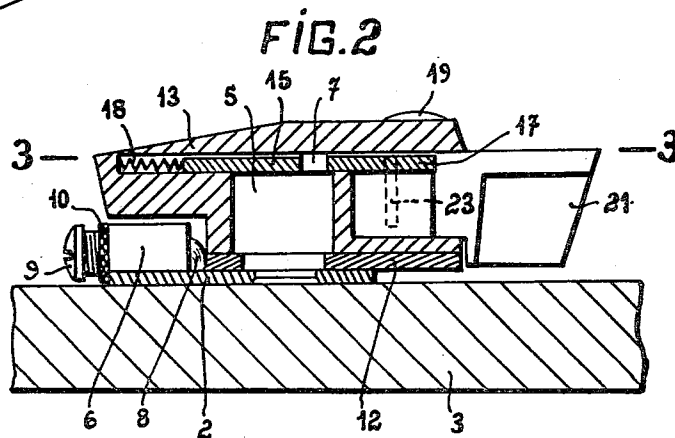
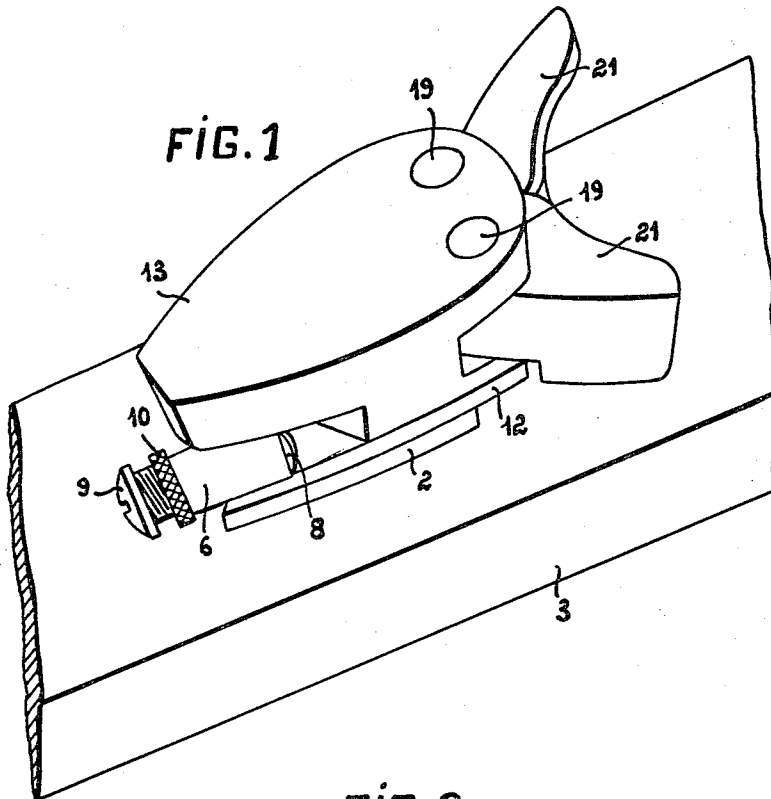
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SAFETY SECURING MEANS FOR SKIS

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FIG. 3

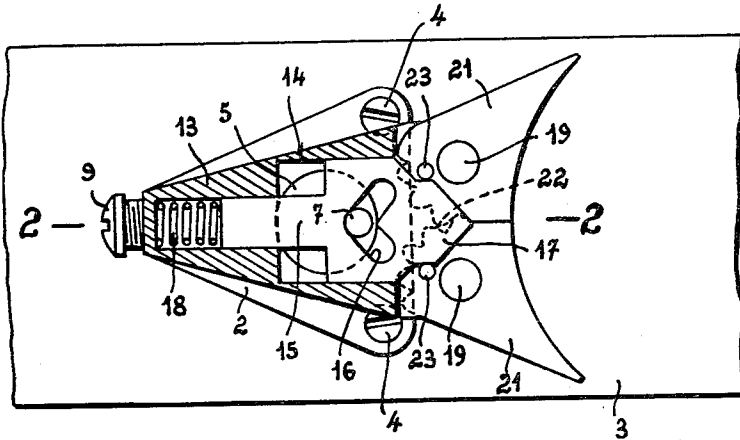
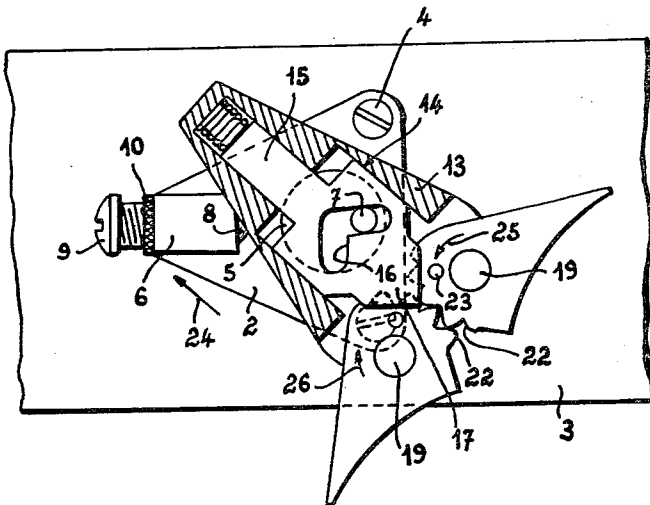


FIG. 4



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SAFETY SECURING MEANS FOR SKIS

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My invention relates to safety securing means for skis of the so-called "abutment" type, wherein the front of the skier's shoe is held in position under the action of a cable, belt or the like, or of the thrust of any suitable part against an arcuate member fitted over the upper surface of the ski and the general shape of which allows the lateral release of the skier's shoe in the case of a dangerous twisting effort exerted on the leg or foot of the skier.

My improved securing means is more particularly of the type wherein the abutment is pivotally secured to a stationary axis perpendicular to the plane of the ski and is subjected to an elastic thrust holding it in a normal longitudinal position, while it allows an angular shifting round said axis whenever the lateral stress exerted by the skier's shoe rises above a predetermined value.

My improved securing means is characterized with reference to all known securing means by the fact that the abutment member which is pivotally secured to said stationary axis or pivot, carries in its rear section two parallel spindles serving as a pivotal connection for two jaws which define an arcuate line engaged by the front end of the skier's shoe, while means controlled by an eccentric member rigid with said stationary axis are provided for holding fast the two jaws with reference to each other whenever the main pivoting abutment member is in its normal operative position and, in contradistinction, said jaws are released when last-mentioned abutment member is shifted angularly in either direction.

The means serving for the locking of the two jaws when the main abutment member occupies its normal position may, of course, be designed in various manners.

Thus, according to a preferred embodiment, said main abutment member is designed so as to form a slideway for a further member provided with a groove through which passes an eccentric stud fitted on the axis of the body of the abutment member, said grooved member terminating at its rear end in the shape of a wedge engaging a housing of the same outline, bounded by the two jaws, while it is subjected at its front end to the thrust of a spring urging it rearwardly, so as to hold said wedge in said housing and thereby to hold the two jaws fast, the release of said jaws being obtained only after an angular shifting of the main abutment member, which leads to a movement of the eccentric stud, with a view to producing a forward sliding of the wedge-shaped end of the groove member.

When released, the two jaws may furthermore assume a rocking movement in opposite directions; it is sufficient for this purpose for the two jaws to show in their contacting areas an arcuate outline, while said areas are provided with teeth, so as to act as two interengaging pinions.

The securing means described has the following advantages:

Firstly, by reason of the length of the contacting surface between the abutment and the shoe and by reason of the enclosing shape of said abutment, which length and shape are allowed by the actual structure of the abutment as a dual jaw system, the behaviour of the shoe is far improved over that obtained with conventional abutments; and

Secondly, by reason of the instantaneous release of said jaws, the release of the skier's foot upon the abutment assuming a pivotal movement is perfectly free, which leads to perfect reliability.

My invention will be readily understood together with

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its advantages and further features upon reading of the following description, reference being had to the accompanying diagrammatic drawings illustrating by way of example and by no means in a limiting sense, a preferred embodiment of my improved securing system. In said drawings:

FIG. 1 is a perspective view of the safety system.

FIG. 2 is a vertical longitudinal sectional view through line 2—2 of FIG. 3.

FIGS. 3 and 4 are horizontal sectional views through line 3—3 of FIG. 2, respectively for the normal and released position of the arrangement.

2 designates a plate having a generally V-shaped outline and forming the pedestal of the securing means which is thus secured to the ski 3 through the screws 4 (FIG. 3). Said pedestal 2 is rigid with a vertical pivot 5 and with a longitudinal tapped sleeve 6. The stationary vertical pivot 5 carries an eccentric stud 7 at its upper end, while the tapped sleeve 6 lies to the front of the pedestal 2 along the longitudinal axis of the ski 3. Said sleeve carries at its rear end opening a ball 8 which is urged forwardly by a spring which is not illustrated in the drawings, since it is carried inside the sleeve, while a screw 9 engaging the front end of the sleeve allows said spring to exert a more or less considerable pressure on the ball 8 according to the extent of its screwing inside the sleeve. A safety nut 10 allows holding the screw 9 fast in the desired adjusted position.

The ball 8 engages, as well known per se, a plate 12 which plays the part of a cam and is provided with at least one notch, the bottom of which is engaged by said ball 8.

According to my invention, said plate 12 is rigid with the body 13 of the main abutment member fitted over the stationary pivot 5 and provided in its upper section with a housing 14; inside the latter is slidably fitted a plate 15, the medial part of which is grooved at 16; the groove thus formed in the plate 15 is in the shape of a V and is engaged by the eccentric stud 7 rigid with the spindle 5. At its rear end, 17, the said plate 15 is in the shape of a wedge, while its front end is subjected to the thrust exerted by a spring 18 carried inside the housing 14 and urging the plate 15 rearwardly.

At its rear end, the body 13 of the main abutment member carries two parallel vertical spindles 19 round which are pivotally secured the corresponding jaws 21 appearing in plan view as arcuate parts and vertically as angle bars. The two jaws 21 define thus a comparatively long arcuate line which encloses to a large extent the entire front section of the skier's shoe.

In their contacting areas, said two jaws 21 are given, furthermore, the shape of portions of a cylinder in which are provided teeth 22, the teeth of one jaw meshing with those of the other jaw. Said jaws 21 are lastly rigid with two studs 23 between which is fitted the wedge-shaped end 17 of the sliding plate 15 which, under the action of the thrust exerted by the spring 18 in association with the shape of the groove 16 engaged by the stud 7, allows the two jaws 21 to be held fast by the wedge-shaped end 17 in alignment with each other whenever the securing means are in their normal position of use, as illustrated in FIG. 3.

Assuming the skier's leg is subjected to a dangerous twisting stress, the whole abutment system is shifted angularly round the stationary pivot 5 as well known in the art, so that the ball 8 moves out of the notch provided for it in the cam 12, since the pressure exerted by the spring inside the sleeve 6 on the ball 8 is no longer sufficient for holding it in said notch.

During the angular shifting of the entire abutment system round the stationary pivot 5, the eccentric stud 7 rigid with said spindle 5 and which was precedingly located at

the bottom of the groove 16, that is at the apex of the V formed by said groove in the sliding plate 15, is urged along an arm of said groove and produces a movement of the sliding plate 15 in the direction of the arrow 24 of FIG. 4, that is forwardly, while it compresses the spring 18. Consequently, the rear wedge-shaped end 17 of the plate 15 is released with reference to the studs 23 rigid with the jaws 21 and, consequently, said jaws are now free to rock round their pivotal spindles 19. By reason of their interconnection through the agency of the teeth 22, the two jaws move then angularly in opposite directions, as illustrated by the arrows 25 and 26 of FIG. 4.

It should however be remarked that, by giving a different shape to the plate 15, it is possible to make it control directly the two jaws 21, the opening and closing of which are then synchronized with the rocking of the body 13 of the abutment system.

After opening of the jaws, the return into the normal position illustrated in FIG. 3 is obtained simply through a pressure exerted on the jaws 21 in a direction opposed to the twisting stress which had produced their opening.

Obviously, my invention is by no means limited to the sole embodiment of the safety means for skis which has been disclosed hereinabove by way of example and it covers, in contradistinction, all the modifications thereof falling within the scope of the accompanying claims, whatever may be, in particular, the shape of the groove 16 and various improvements may be brought, such, for instance, as means for adjusting the height of the jaws with reference to the sole of the skier's shoe.

What I claim is:

1. A safety securing system for skis, comprising a pivot rigid with and perpendicular to the upper surface of the ski at a location along the longitudinal axis of the ski, a member rotatably supported on said pivot and normally assuming a position in axial registry with the axis of the ski, means extending along the longitudinal axis of the ski and releasably and yieldingly holding said member in the normal position thereof, two spindles parallel to the pivot and rigid with said member, jaws rotatably supported on said spindles and defining in a normal cooperating position, corresponding to the normal position of said member, a rearwardly facing arcuate outline adapted to engage the toe of the skier's foot, an eccentric stud rigidly coupled to the pivot at a location registering with the longitudinal axis of the ski, a flat member slidably supported in the rotatably supported member for movement between a forward and a rearward position, pins on said jaws, said flat member including a portion extending between the pins of the jaws in the rearward position of the member to cause said jaws to assume the normal position thereof, said flat member being provided with a rearwardly flaring V-shaped groove arranged symmetrically with respect to the longitudinal axis of the rotatably supported member and engaging the eccentric projection to produce relative shifting of the latter in said groove upon angular movement of the rotatable member relative to the ski to cause forward sliding of the flat member with reference to the rotatably supported member to cause the portion of the flat member to be withdrawn from said pins to release said jaws, and means urging said flat member elastically rearwards with reference to the rotatably supported member.

2. A safety securing system for skis, comprising a pivot rigid with and perpendicular to the upper surface of the ski at a location along the longitudinal axis of the ski, a member rotatably supported on said pivot and normally assuming a position in axial registry with the axis of the ski, means extending along the longitudinal axis of the ski and releasably and yieldingly holding said member in the normal position thereof, two spindles parallel to the pivot and rigid with said member toothed interengaging jaws rotatably supported on said spindles and defining in

a normal cooperating position corresponding to the normal position of said one member a rearwardly facing arcuate outline adapted to engage the toe of the skier's foot, an eccentric stud rigidly coupled to the pivot at a location registering with the longitudinal axis of the ski, means for operatively coupling the rotatably supported member and the jaws to cause said jaws to be locked in said normal position, and means operatively connecting the rotatably supported member with the eccentric member and effective to actuate the last said means to lock the two jaws on the rotatably supported member in the cooperating position thereof when said member is in the normal position thereof and to release the jaws when said member is angularly rotated.

3. For use with a ski, apparatus comprising: a plate adapted for being rigidly secured to the ski along the longitudinal axis of the ski, a body, means supporting the body from the plate for rotation about an axis, a fixed stud on said means eccentrically located relative to said axis of rotation, said body being provided with a housing extending perpendicularly to the stud, a flat member in said housing provided with a V-shaped groove, said stud projecting into said V-shaped groove, a pair of jaws, means rotatably supporting each of the jaws from the body, and means on said jaws for cooperating with the flat member to lock said jaws with respect to said body with said flat member in a first position relative to the body, said fixed stud being located in the groove at the apex thereof in said first position, said fixed stud causing sliding movement of said flat member in said housing upon angular movement of said body from said first position relative to said plate whereby said flat member is moved to a position whereat the means for locking the jaws is ineffective and said jaws are freely rotatable relative to the body.

4. Apparatus for use with a ski comprising a plate adapted for being rigidly secured to the ski along the longitudinal axis of the ski, a pivot rigidly supported on said plate and extending therefrom, a stud rigidly supported on said pivot in eccentric fashion, a body supported on said pivot and rotatable with respect to said plate, said body defining a housing extending perpendicularly to the stud, a flat member slidably supported in said housing of the body, said flat member being provided with a V-shaped groove in which is positioned said stud, a pair of jaws each being rotatably supported on said body and defining in a closed position a rearwardly facing arcuate outline adapted for engaging the toe of a skier's foot, a stud on each of the jaws cooperatively defining a space therebetween, said flat member including a wedge-shaped end portion projecting between said studs on the jaws with the stud on the pivot located at the apex of the groove in the plate whereby said jaws are prevented from rotating relative to the body, said stud on the pivot being effective upon relative rotation of the body and plate to cause movement of the flat member away from the studs on the jaws thereby permitting free rotation of the jaws relative to the body.

5. Apparatus as claimed in claim 4 comprising means for locking the plate and body together to prevent relative rotation therebetween.

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