Aug. 1, 1961 H. HVAM 2,994,543

TOE HOLDING DEVICE FOR SKIS

Filed May 9, 1960

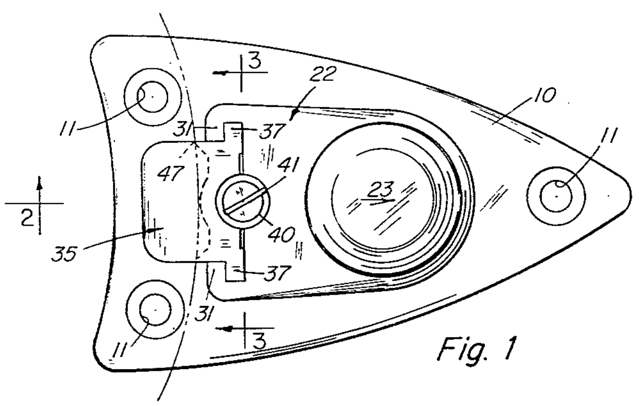

Fig. 1

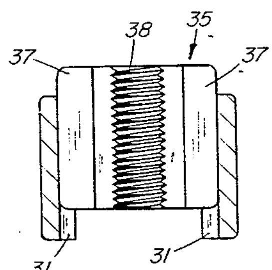

Fig. 3

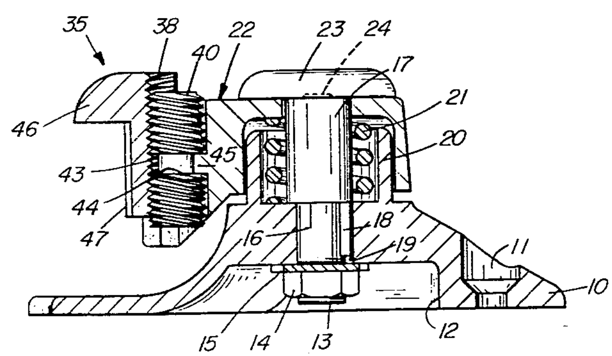

Fig. 2

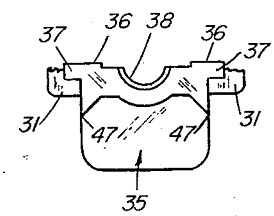

Fig. 4

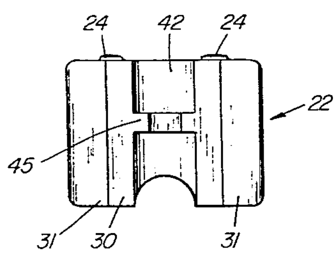

Fig. 6

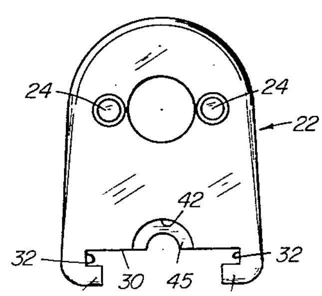

Fig. 5

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TOE HOLDING DEVICE FOR SKIS

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5 Claims. (Cl. 280—11.35)

My present invention comprises a toe holding device for a ski, the invention being of utility in ski bindings of the type which release the ski from the skier in the event of strains of a nature which might cause injury. Such ski bindings usually comprise a spring or other means for forcing the toe of the foot against a toepiece. The present invention is of utility in a toe holding device comprising a vertically pivoted strain-release means which permits the toe of the boot to move laterally into a releasing position when a lateral strain beyond safe limits occurs.

An object of the present invention is to provide means for holding the toe of the boot in normal position regardless of the style of the toe or the thickness of the sole of the toe.

A further object of the present invention is to provide means of the foregoing character which may be easily operated to hold the toe in position, which is made of relatively few, simple, rugged parts which are easily manufactured and assembled.

The purposes and objects of the present invention will be more readily understood by reference to the following specification taken in connection with the accompanying drawings wherein like numerals refer to like parts throughout.

In the drawings,

FIG. 1 is a plan view of the present invention;

FIG. 2 is a vertical section taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a vertical section taken substantially along line 3—3 of FIG. 1;

FIG. 4 is a bottom view of FIG. 3;

FIG. 5 is a plan view of a part of the invention; and

FIG. 6 is an end view of FIG. 5.

The toe holding device comprises a base **10** having a planar, peripheral, lower surface adapted to engage the upper surface of a ski to which it is attached by means of screws passing through screw-receiving openings **11**. The base has a central recess **12** in which there is positioned the threaded lower end of a vertically extending pivot bolt **13**, a nut **14** threaded thereon, and a lock washer **15**. The bolt has a lower portion **16** of small diameter and an upper portion **17** of large diameter separated by a shoulder which bears upon an upper surface of the base and provides means for clamping the bolt in position. The reduced portion **16** is keyed to the base by a key **18** projecting from the bolt into a slot **19** in the base. The larger portion **17** of the bolt is surrounded by a spring-retainer wall **20** rising from the upper surface of the base, in which there is retained a strain-release spring **21** held under compression. The upper end of the spring bears against a lower surface of a toe holding device arm **22**, the upper surface of which is urged by the spring against the large flat head **23** of the bolt. The upper surface of the arm **22** is provided with a plurality of rounded projections **24** which project into complementary recesses in the lower surface of the bolt head **23**, as indicated in FIG. 2, when the arm is in boot-holding position, that is to say projecting rearwardly over the base in the direction of the length of the ski. The construction thus far described provides a vertically pivoted strain-release means mounted on the base for retaining the toe holding device arm in its position of use under normal conditions, and which yields to permit pivotal movement of the toe holding device arm in either

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direction so as to release the boot when danger to the skier threatens.

The free end of the toe holding device arm **22** is provided with a vertical guideway on the end surface **30** thereof, the same being provided by a pair of inwardly facing, laterally spaced flanges **31** each defining a vertical groove **32**. The surface **30**, flanges **31** and grooves **32** constitute a guideway formed on the end of the toe holding device arm.

The guideway slideably guides a toe holding jaw **35** which is provided with surface portions **36** which slide against the end surface **30** and a pair of laterally projecting tongues **37** which are engaged in the grooves **32**. Between the surfaces **36** the toe holding jaw is provided with a recess **38** which is threaded to define a half-nut surface. A toe holding jaw adjusting screw **40** provided with a transverse driving slot **41** in its upper end is engaged with the half-nut threads. The remainder of the screw projects into a recess **42** in the end surface **30** of the toe holding device arm. The screw is provided with an intermediate, non-threaded portion **43** of reduced diameter which provides an annular groove **44** in the body of the screw, and an annular flange **45** in the recess **42** is engaged in the groove **44** to prevent longitudinal movement of the screw while permitting its rotation. When the screw is rotated in one direction a flange **46** at the top of the jaw is drawn down toward the upper surface of the toe portion of the sole of a thin soled ski boot, and thicker soled ski boots may be accommodated when the screw is rotated in the opposite direction. The rearwardly facing surface of the jaw is provided with a pair of sharp, vertically extending ridges **47** which are adapted to engage the end surface of the toe of the ski boot, the ski boot being forced thereagainst by the usual spring ski binding or other means. The toe is therefore releasably held in normal position.

From the foregoing it can be seen that the ski boot toe is held in proper position under normal strains, but that if a dangerous strain should be exerted such as might cause the skier's leg to be broken, the toe holding device arm will swing laterally in either direction, permitting the ski to release itself from the skier.

Having illustrated and described a preferred embodiment of the present invention, it should be apparent to those skilled in the art that the same permits of modification in detail and arrangement. I claim as my invention all such modifications as come within the true spirit and scope of the appended claims.

I claim:

1. A toe holding device for a ski comprising a base adapted to be mounted on the upper surface of a ski, vertical pivot means mounted on said base, a toe holding device arm pivotally mounted on said pivot means and having a free end, strain-release means normally holding said toe holding device arm in fixed relation to said pivot means, said free end having a vertical guideway formed thereon, a toe holding jaw slideably engaged with said guideway for vertical movement with respect to said toe holding device arm, a toe holding jaw adjusting screw vertically positioned between said arm and said jaw, said jaw and said arm having contiguous surfaces, in one of which there is a half-nut surface threadedly engaging a portion of said screw, and in the other of which there is a recess surrounding the remainder of said screw, said screw having a non-threaded portion, and means formed on the other of said surfaces and engaging said non-threaded portion for preventing longitudinal movement of said screw.

2. A toe holding device for a ski comprising a base adapted to be mounted on the upper surface of a ski, a vertical pivot mounted on said base, a toe holding device arm pivotally mounted on said pivot and having a free

end, complementary projection and recess portions on said pivot and arm normally interfitting to hold said arm in toe holding position, resilient means normally holding said portions in interfitting relation to each other and yieldable to permit their separation, said free end having a vertical guideway formed thereon, a toe holding jaw slideably engaged with said guideway for vertical movement with respect to said toe holding device arm, a toe holding jaw adjusting screw vertically positioned between said arm and said jaw, said jaw and said arm having opposed recesses therein, one of said recesses being of half-nut configuration threadedly engaging said screw, and the other of said recesses being of larger diameter than said screw, said screw having an intermediate, non-threaded portion of reduced diameter defining an annular groove, and a projection in said other recess engaged in said annular groove for preventing longitudinal movement of said screw.

3. A toe holding device for a ski comprising a base adapted to be mounted on the upper surface of a ski, vertical, vertically pivoted strain-release means mounted on said base, a toe holding device arm pivotally mounted on said strain-release means and having a free end, said free end having a vertical guideway formed thereon, a toe holding jaw slideably engaged with said guideway for vertical movement with respect to said toe holding device arm, and a toe holding jaw adjusting screw vertically positioned between said arm and said jaw, said jaw having a threaded half-nut surface threadedly engaging said screw, said screw having a longitudinally intermediate portion of reduced diameter defining an annular groove and said arm having means thereon engaged within said groove to prevent longitudinal movement of said screw when rotated.

4. A toe holding device for a ski comprising a base adapted to be mounted on the upper surface of a ski, a vertical pivot extending upwardly from said base on the longitudinal centerline thereof, a toe holding device arm member pivotally mounted on said pivot and having a free end projecting rearwardly therefrom in overhanging relation to the rear portion of said base, a toe holding jaw member mounted on said arm, one of said members having a laterally spaced pair of vertical, transversely facing grooves formed therein and the other of said members having vertical edge portions respectively engaged in said grooves whereby said jaw member is guided for vertical movement with respect to said arm member, said jaw member being provided with a pair of vertically extending, laterally spaced sharp edges adapted to engage the end surface of the toe of a ski boot, a jaw member adjusting screw vertically positioned at the free end of said arm member, means on said arm member engaging said screw for preventing longitudinal movement thereof while permitting rotation of said screw, and means threadedly engaging said screw for causing vertical adjustment of said jaw member.

5. A toe holding device for a ski comprising a base adapted to be mounted on the upper surface of a ski, vertical pivot means mounted on said base, a toe holding device arm portion pivotally mounted on said pivot means and having a free end, a toe holding jaw portion mounted on said arm portion, one of said portions having a laterally spaced pair of transversely facing, vertical grooves formed therein and the other of said portions having vertical edge portions respectively engaged in said grooves whereby said jaw portion is guided for vertical movement with respect to said arm portion, an adjusting screw vertically positioned between said arm and jaw portions, said screw being mounted on one of said portions and restrained against vertical movement relative thereto, the other of said portions having threaded means operatively associated therewith cooperatively engaging the threads on said screw for effecting vertical movement of said jaw portion upon rotation of said screw.

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