April 29, 1969

E. A. DE GROOD

SKI RELEASE HARNESS

3,441,286

Filed June 7, 1967

Sheet 1 of 3

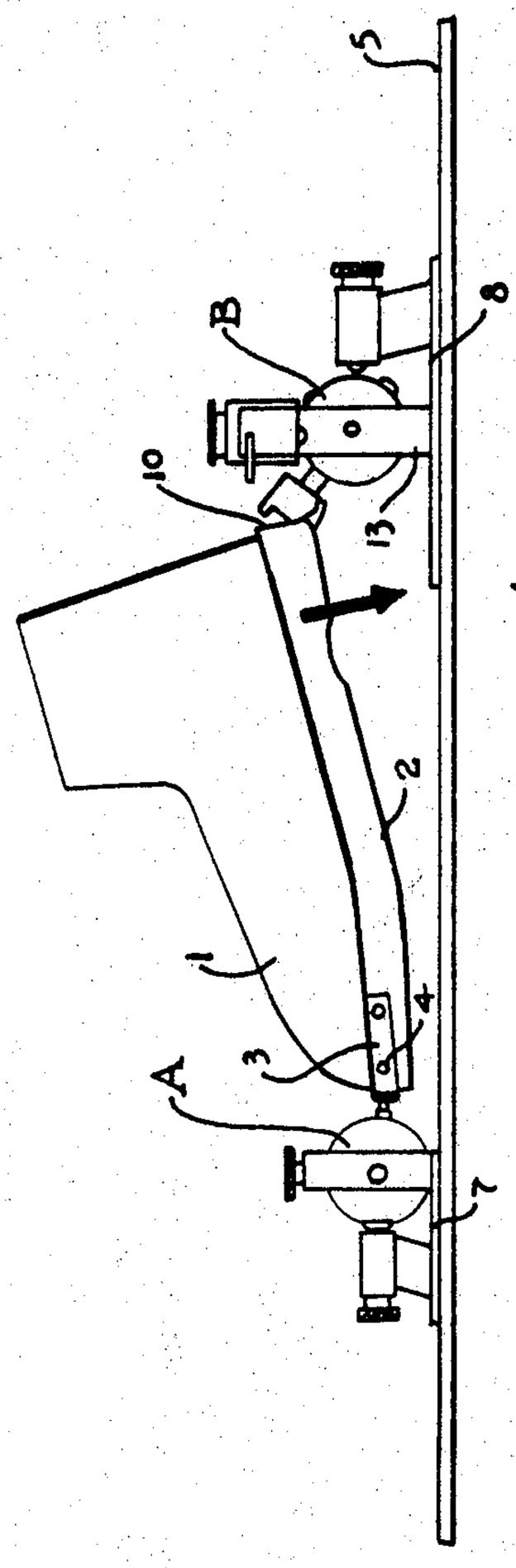



FIG-1

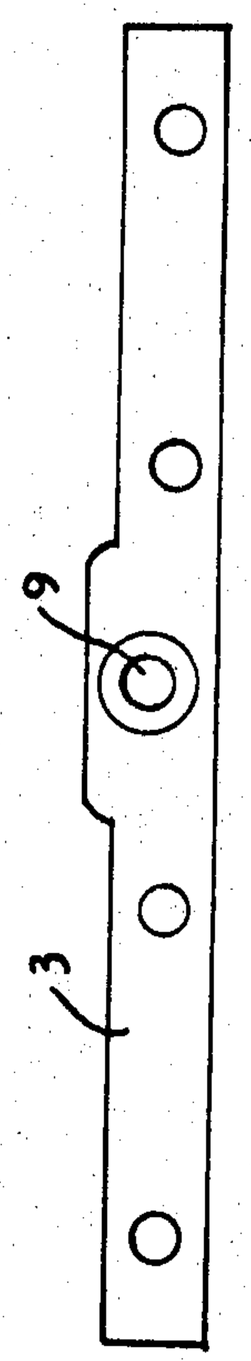



FIG-3

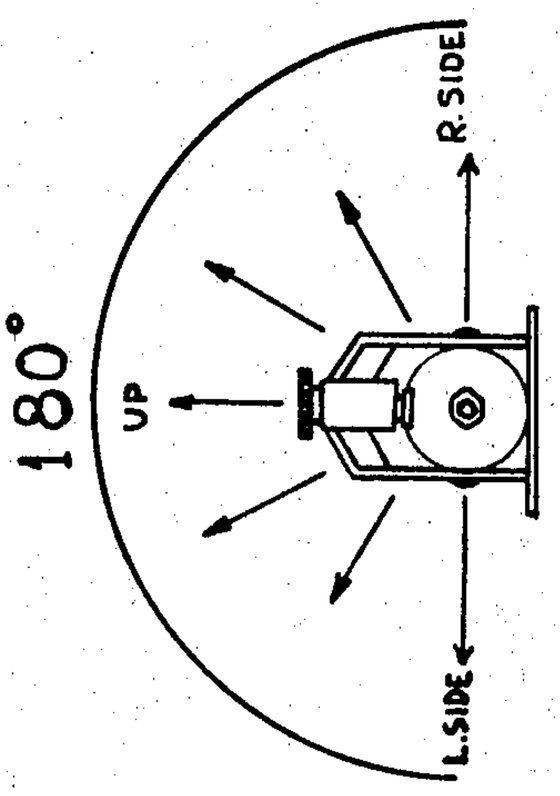



FIG-2

SKI RELEASE HARNESS



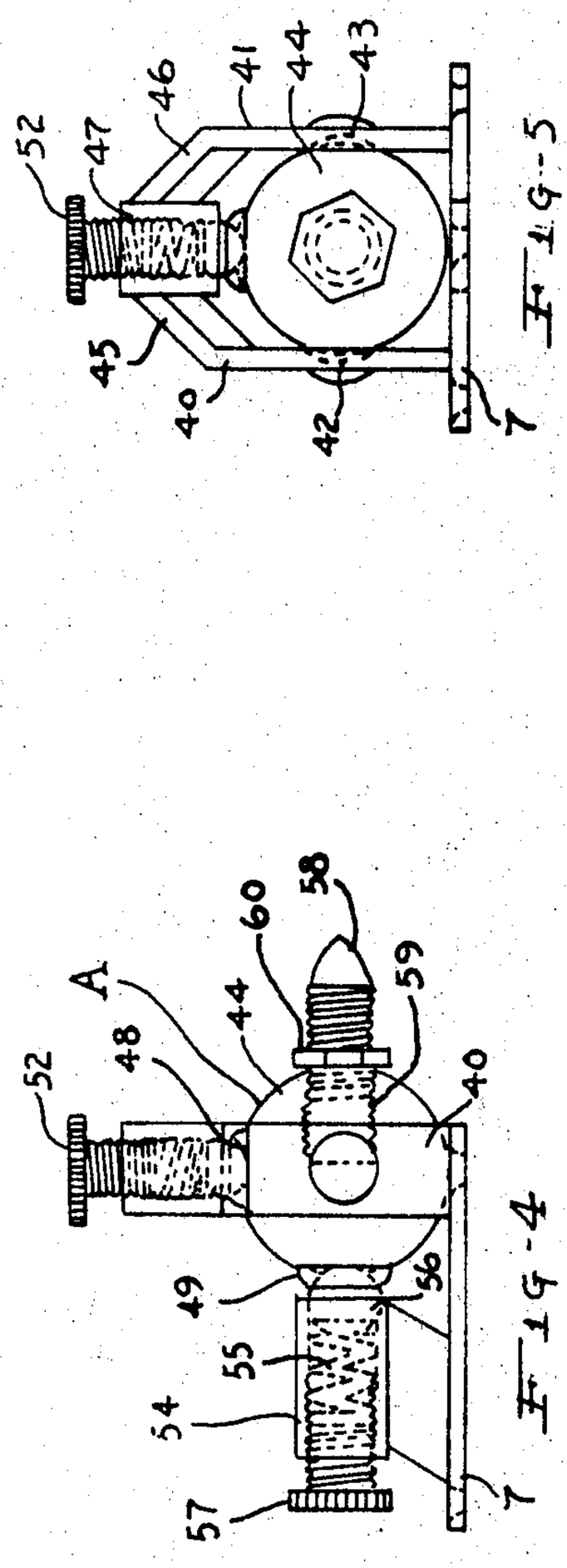



FIG-5

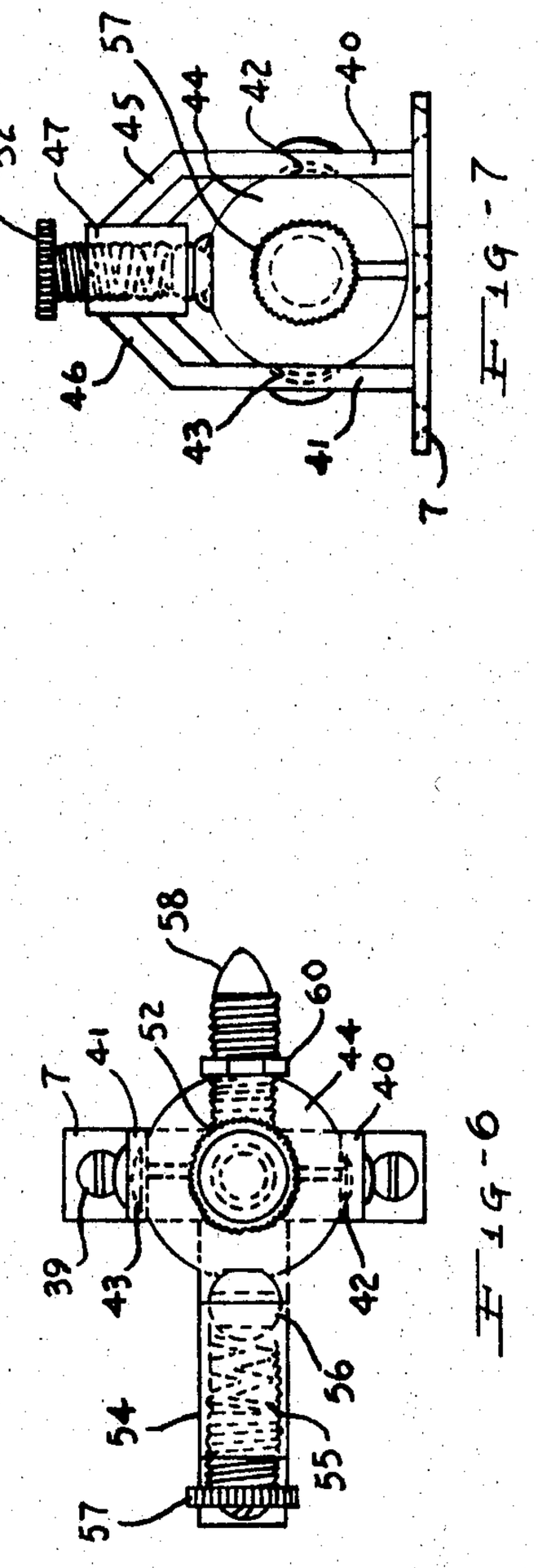



FIG-7




FIG-4




FIG-6

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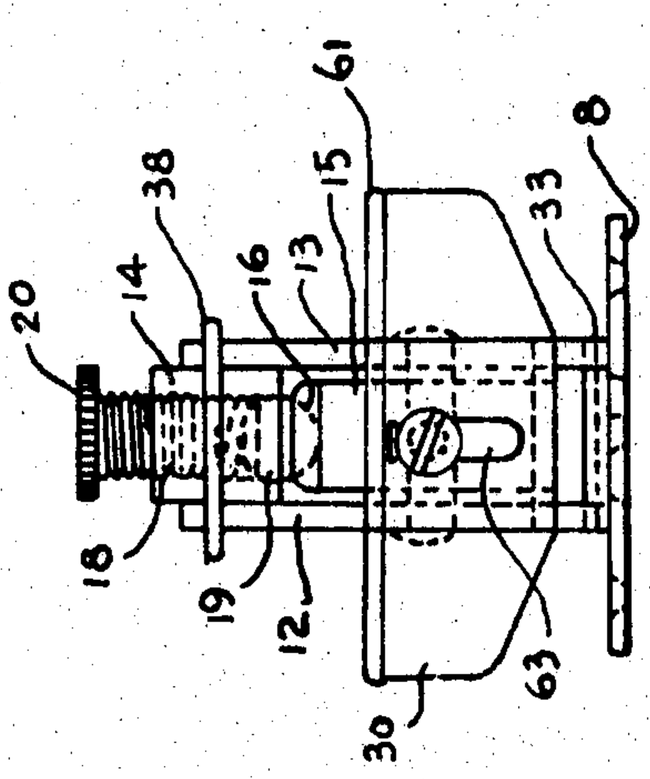



Fig 9

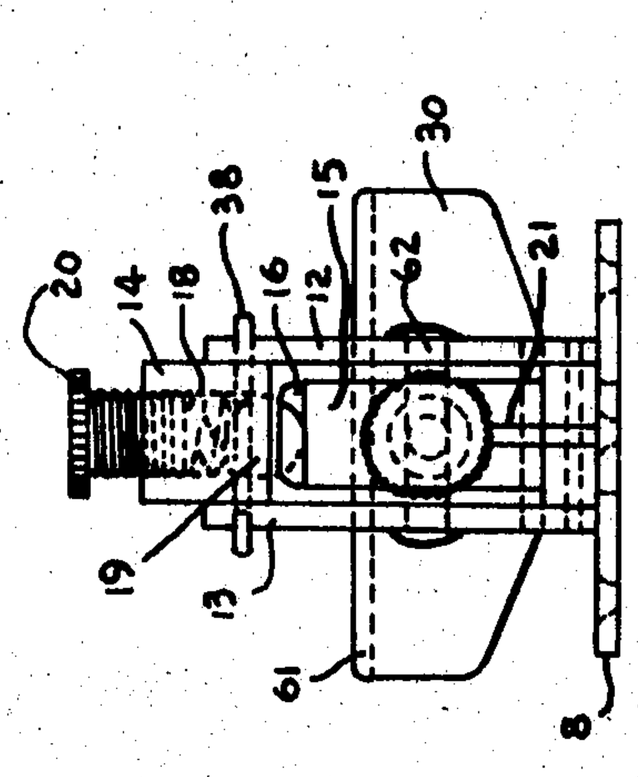



Fig 11

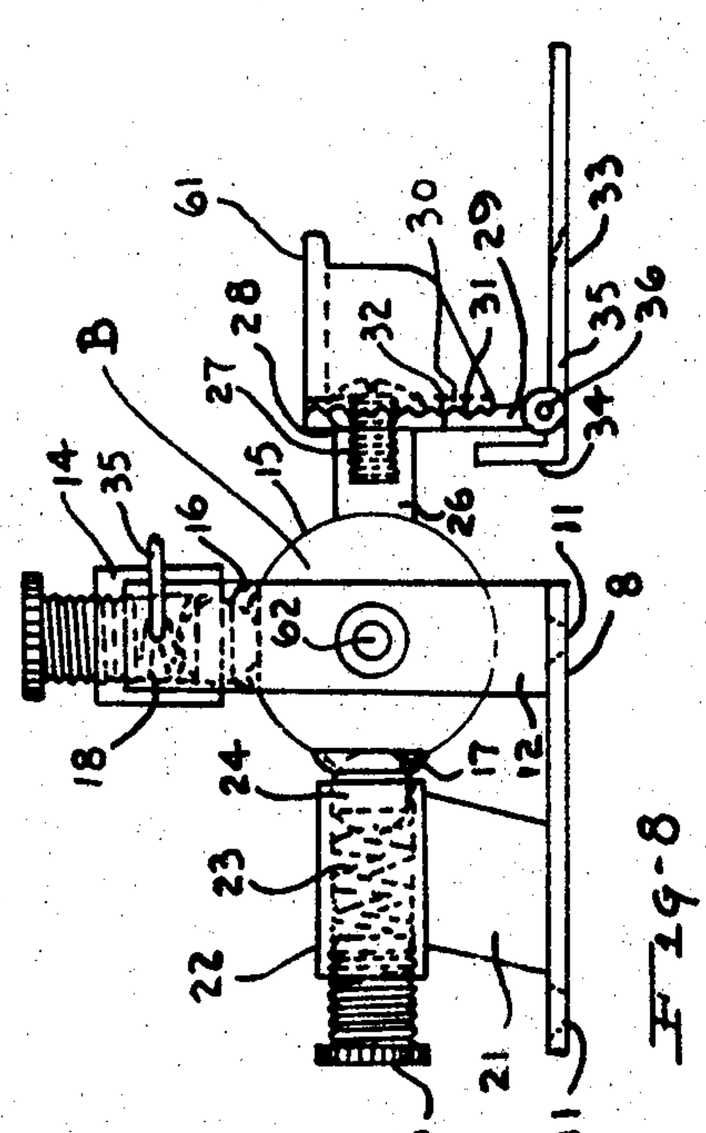



Fig 8

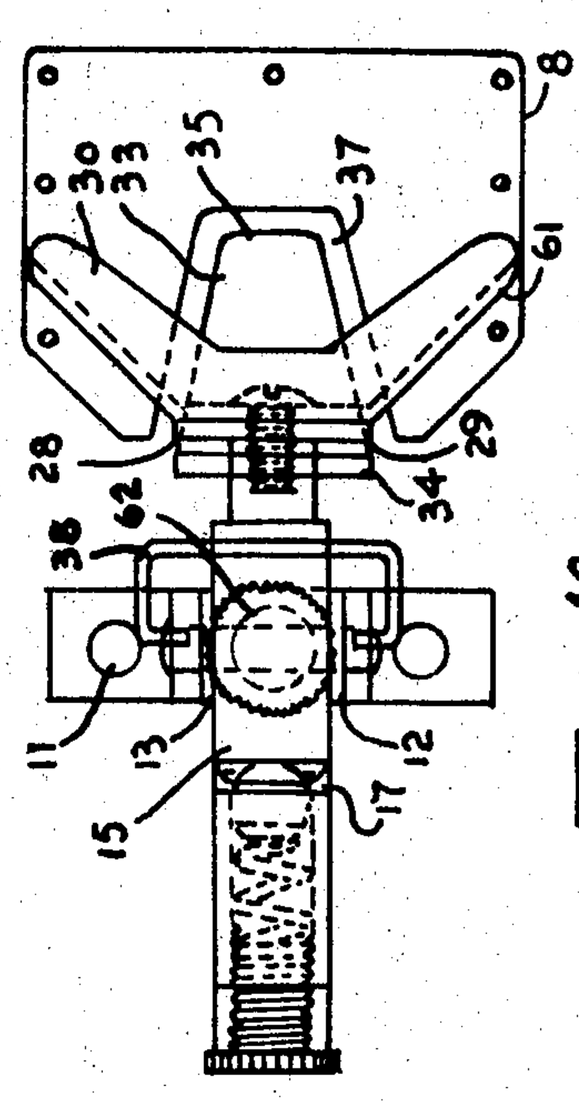



Fig 10

# United States Patent Office

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3,441,286


# SKI RELEASE HARNESS


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U.S. Cl. 280—11.35

7 Claims



## ABSTRACT OF THE DISCLOSURE

An apparatus mounted on the upper surface of a ski and comprising a toe harness and a heel harness for releasably securing both the toe and heel portions of a boot to the ski. The harness for both the toe and heel portions of a ski boot is adjustable for boots of various sizes as well as thickness of the boot soles and yet the harness is firmly fitted to the toe and the heel of the boot when in operation or use but will release the boot when the skier falls in any direction.


### *Field of the invention*

The present invention pertains to means or devices for securing or attaching a ski to a boot or shoe. The means or devices are referred to as a harness which is mounted on the upper face of a ski for engaging and clamping a boot or shoe to the ski. The harness which engages the toe portion of the boot or shoe as well as the harness engaging the heel portion will release the boot or shoe when the skier falls so as to avoid injury to the ankles and legs of the skier. Under normal conditions of usage the boot or shoe will be firmly engaged by both the toe and nesses employ spring and piston types of releasing mechanism for both the toe and heel portions of the ski boots heel harness to insure the proper retention of the boot or shoe upon the ski.

### *Prior art*

The prior art is replete with many types of ski releasing harnesses for the purpose of releasing the skier's boots from the skis in the event of a fall in the effort to avoid injury to the skier. Some of the prior ski releasing harnesses employ spring and piston types of releasing mechanism for both the toe and heel portions of the ski boots while other types of harness structures utilize ball and spring members.

### *Summary of the invention*

The present invention is directed to a safety releasing harness for a ski that has a separate toe harness and a separate heel harness which are easily adjustable and so designed as to firmly grip a ski boot. The ski releasing harness will readily release the boot of the skier when the skier falls in any direction.

### *Description of the drawings*

FIGURE 1 is a schematic view of a ski boot with the safety release harness of the present invention;

FIGURE 2 is a diagrammatic view of certain of the releasing features of the toe releasing harness;

FIGURE 3 is an elevational view of the ski boot toe piece;

FIGURE 4 is a side view of the toe releasing harness;

FIGURE 5 is a rear view of the toe releasing harness as shown in FIGURE 4;

FIGURE 6 is a plan view of the toe releasing harness as shown in FIGURE 4;

FIGURE 7 is a front view of the toe releasing harness as shown in FIGURE 4;



FIGURE 8 is a side view of the heel releasing harness;

FIGURE 9 is a front view of the heel releasing harness as shown in FIGURE 8;

FIGURE 10 is a plan view of the heel releasing harness as shown in FIGURE 8; and

FIGURE 11 is a rear view of the heel releasing harness as shown in FIGURE 8.

### *Description of the preferred embodiments*

Referring to the drawings, particularly FIGURES 1, 2 and 3, a schematic view of the safety release harness for skiing is shown consisting of a ski boot **1** having a sole **2**, a metal plate **3** attached by screws **4** or the like to the front edge of the boot sole **2**, part of a ski **5**, base plates **7** and **8** fastened by screws or the like to the ski **5**, a toe releasing harness generally referred to as A, and a heel releasing harness generally referred to as B. FIGURE 1 shows the releasing harness in open position with the central aperture **9** of the metal plate **3** contacting the toe releasing harness A and the heel **10** of the ski boot **1** contacting the heel releasing harness B before being pressed down into the closed position.

The heel releasing harness B shown in FIGURES 8 to 11 inclusive consists of the base plate **8** which is fastened by screws through the holes **11** to the ski. Vertically mounted supports **12** and **13** are fixed to the base plate **8**. A cylindrical member **14** is mounted on the top of and between the supports **12** and **13**, and a rotatable wheel **15** is mounted on an axle **62** between the supports **12** and **13**. The rotatable wheel **15** is provided with two cup shaped lips **16** and **17**. A spring **18** and ball member **19** is mounted between the upper parts of the supports **12** and **13** and the ball **19** fits within the cup shaped lip **16** with a tension adjusting screw **20** mounted in the cylindrically shaped member **14** for adjusting the pressure of the ball **19** on the rotatable wheel **15**. A vertical bracket **21** is fixed to the base plate **8**, and a hollow cylindrical member **22** is fixed horizontally to the upper part of the bracket **21**. A spring **23** and a ball member **24** is mounted in the hollow cylindrical member **22** and the ball **24** fits within the cup shaped lip **17** with a tension adjusting screw **25** mounted in the hollow member **22** for adjusting the pressure of the ball **24** on the rotatable wheel **15**. A solid metal member **26** is fixed to the forward side of the rotatable wheel **15** and the forward end of the metal member **26** is internally screw threaded to receive an adjusting bolt **27**. A heel holder is mounted on the outer end **28** of the metal member **26** and comprises two adjustable plates **29** and **30**, the forward side of the plate **29** being formed with serrations **31** which intermesh with serrations **32** formed on the rear side of the plate **30**. The heel plate holder part **29** is fixed, for example, by welding to the outer end **28** of metal member **26**, while the heel holding part **30** is provided with a slot **63** through which the adjusting bolt passes to lock the two parts **29** and **30** in proper position according to the ski boot heel thickness. The heel holder part **30** is U-shaped as shown in plan view in FIGURE 10 and in side view in FIGURE 8 to form a wraparound design to keep the ski boot from sliding sideways.

A step on plate **33** formed from a vertical stop part **34** and a horizontal heel part **35** is hinged at **36** to the lower side of the heel holder part **29** and fits in a slot **37** of the base plate **8**. A strap holder **38** is pivotally connected to the upper parts of the vertical supports **12** and **13** for connection to a strap wrapped around a ski boot.

The toe releasing harness A shown in FIGURES 4 to 7 inclusive consists of the base plate **7** which is fastened by screws **39** or the like to the ski as shown in FIGURE 6. Two vertically mounted supports **40** and **41** are fixed to the rear end of the base plate **7**, and their inner sides are formed with circular ball recesses **42** and **43** between

which a rotatable ball **44** is mounted. The upper ends **45** and **46** of the supports **40** and **41** are bent towards one another and a vertical cylindrical member **47** is fastened, for example by welding, between the said upper ends **45** and **46**. Two cup shaped lips **48** and **49** are formed at right angles to one another on the rotatable ball **44**. A spring **50** and a ball **51**, FIGURE 5, are fitted in the hollow cylindrical member **47** and the ball **51** fits in the cup shaped lip **48** and a tension adjusting screw **52** is mounted in the hollow member **47** for adjusting the pressure of the ball **51** against the rotatable ball **44**. A bracket **53** is mounted vertically on the base plate **7** and a hollow cylindrical member **54** is fixed to the upper end of said bracket **53** as shown in FIGURE 4. A spring **55** and a ball **56** are fitted in the hollow member **54** and the ball **56** fits in the cup shaped lip **49** and a tension adjusting screw **57** is mounted in the hollow member **54**. A toe point **58** is screwthreaded as shown in FIGURES 4 and 6. A screwthreaded opening **59** is tapped into the rear side of the rotatable ball **44** into which the toe point **58** is screwed. A lock nut **60** is provided for adjusting the toe point **58** so that it fits snug in the ski boot toe piece central aperture **9**. As shown in FIGURE 2 the ball **44** has a side rotation of 180 degrees.

In the operation of the safety release harness the heel holder **30** is manually raised or rotated which causes the wheel **15** to rotate about its axis **62** thus forcing the balls **19** and **24** against their respective springs **18** and **23**. The movement of the holder **30** and wheel **15** causes the step on plate **33** to be elevated or raised so as to place the heel releasing harness in an open or boot receiving position as shown in FIGURE 1. The toe of the ski boot is then mounted in the toe harness by placing the aperture **9** of the metal plate **3** upon the toe point **58** after which the heel of the boot is pressed downwardly upon the plate **33** forcing same down upon the ski so as to bring the upper rim or lip **61** of the heel holder **30** against the top of the sole of the ski boot for firmly securing the boot to the ski. When an upward pressure is initially applied to the heel holder **30** of the heel release harness the wheel **15** will rotate and the cup shaped lips are pressed against the balls **19** and **24** pushing the balls against the spring tension members. Upon further rotation of the wheel **15** the balls **19** and **24** are freed from the cup shaped lips which releases the harness from the boot. If a skier simply wishes to free himself from the harness, he can use the point of a ski pole between the wheel **15** and the heel holder **30** of the heel release harness and with a prying upward stroke of the pole the harness is released. After either the toe or heel release harness have released the spring tension controlled balls just clear the wheel or large ball so they can move freely. When the toe release harness releases sideways only one of the small balls which is in line with the toe point moves out of the cup shaped lip. On a 45 degree angle fall or a backward fall the two balls move out of their respective cup shaped lips, which gives the toe release harness separate adjustments.

The recesses in the vertical supports are slightly deeper than the diameter of the large ball which only touches on the outer edges of the recesses. The vertical supports are positioned on either side so as to give maximum flexibility to the large ball without being too loose so as to rattle.

I claim:

**1.** A harness for attaching a ski boot to a ski comprising a metal plate having an aperture therein secured to the toe portion of the boot, a member mounted on said ski for rotative movement with respect thereto, a holder for the heel of said boot adjustably connected to said member, said holder having a plate pivotally connected thereto and engaged by said boot for rotating said member and moving said holder into engagement with said boot, a second member mounted on said ski for rotative movement with respect thereto and spaced from said first member, an adjustable toe point mounted in said second member for movement towards or away from said second member, said toe point arranged to project into the aperture in said metal plate for retaining the boot upon said ski in conjunction with said holder.

**2.** A harness for attaching a ski boot to a ski as defined in claim **1** wherein said holder comprises two serrated parts arranged to fit together in adjustable positions with one of said parts being affixed to said first member and the other part having a slot therein for the reception of a bolt to secure said parts in said adjustable positions.

**3.** A harness for attaching a ski boot to a ski as defined in claim **1** wherein said first member is mounted on an axle carried by a pair of vertical standards supported on said ski, a spring biased member carried by said standards for engaging said first member, a bracket supported on said ski and a spring biased member carried by said bracket for engaging said first member at a point diametrically opposite said holder.

**4.** A harness for attaching a ski boot to a ski as defined in claim **2** wherein said part affixed to said first member has said plate pivotally connected thereto.

**5.** A harness for attaching a ski boot to a ski as defined in claim **3** wherein said spring biased member carried by said standards includes a cylindrical member affixed to the upper part of said standards with a spring pressed ball positioned therein for engaging said first member and said bracket has a cylindrical member affixed thereto with a spring pressed ball therein for engaging said first member and tension adjusting screws mounted in each of said cylindrical members.

**6.** A harness for attaching a ski boot to a ski as defined in claim **1** wherein said second member is mounted on an axle carried by a pair of vertical stands supported on said ski, a spring biased member carried by said standards for engaging said first member, a bracket supported on said ski, and a spring biased member carried by said bracket for engaging said first member at a point diametrically opposite said toe point.

**7.** A harness for attaching a ski boot to a ski as defined in claim **6** wherein said spring biased member carried by said standards includes a cylindrical member affixed to the upper part of said standards with a spring pressed ball positioned therein for engaging said first member and said bracket has a cylindrical member affixed thereto with a spring pressed ball therein for engaging said first member and tension adjusting screws mounted in each of said cylindrical members.


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