Aug. 10, 1954 F. WHITAKER 2,686,059

SKI HARNESS

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Fig 1

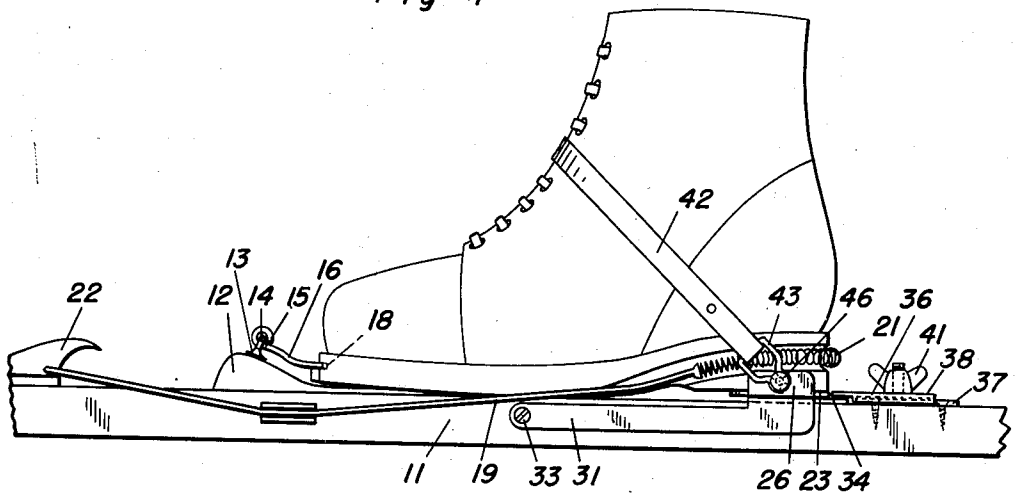


Fig 2

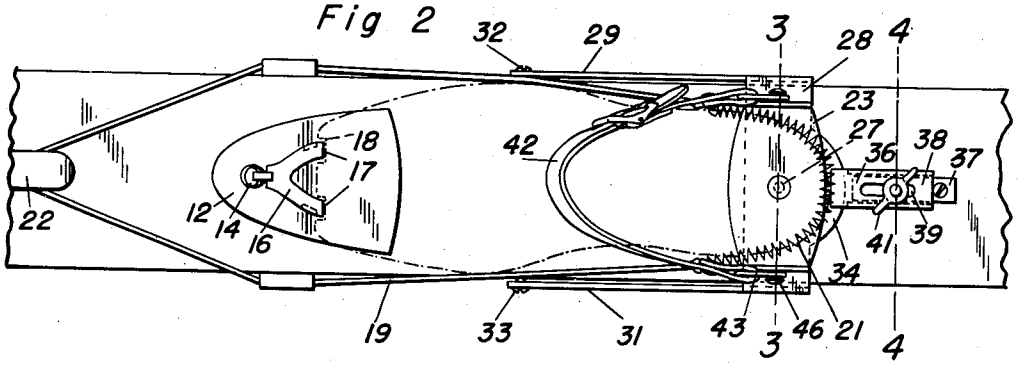


Fig 3

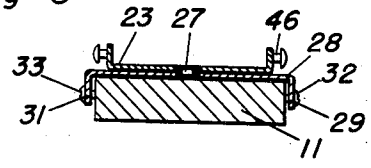
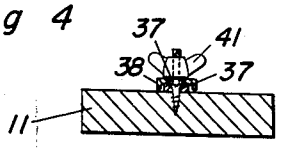


Fig 4



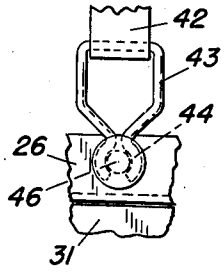


Fig 5

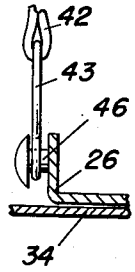


Fig 6

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Fig 7

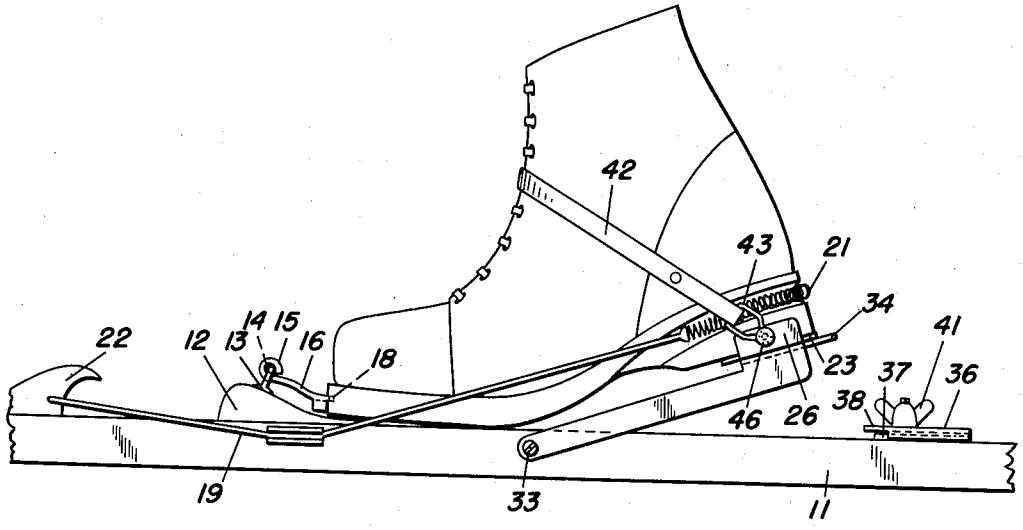
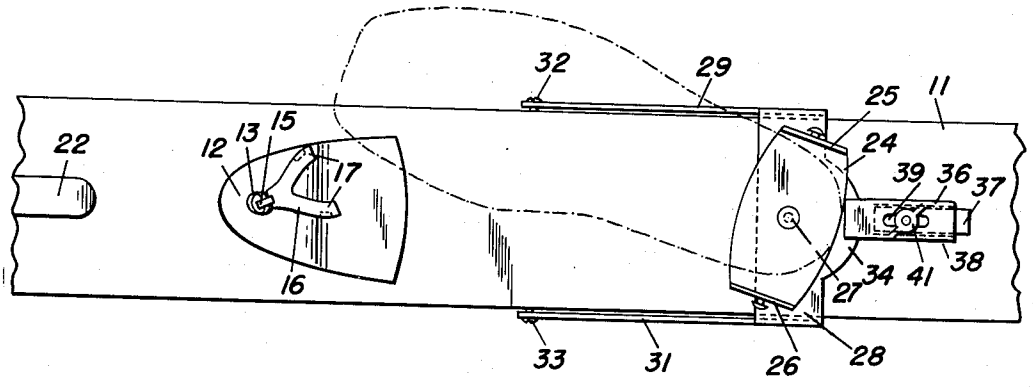


Fig 8



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SKI HARNESS

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Application October 3, 1950, Serial No. 188,137

10 Claims. (Cl. 280—11.35)

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This invention relates to a new and improved ski-harness for securing a skier's boot to a ski.

A principal object of the present invention is to provide a ski-harness assembly of novel construction incorporating a number of new and improved safety features. For example, the present ski-harness construction incorporates novel means to permit rotation of a skier's boot relative to a ski when unusual or abnormal torsional stress or twisting is transmitted to the mechanism, such as may occur when a skier accidentally falls and rolls over in such manner that his legs twist relative to his skis. Such an arrangement obviously minimizes the danger of a skier suffering leg injuries such as frequently occur when a skier falls and his legs cannot twist relative to his skis. The present construction also incorporates a novel ankle strap construction which is adapted to automatically release a skier's boot from the harness when a skier's leg is subjected to abnormal pull in a direction away from the ski as may occur when a skier falls forwardly on his skis, for example.

Another object of the present invention is to provide a ski-harness incorporating a novel touring plate construction which allows for alternate elevation and depression of a skier's heel with respect to the ski to permit a skier to walk or tour in a natural walking manner. Locking means associated with said touring plate are provided to permit a skier to secure, when desired, said touring plate to the top of the ski and prevent raising and lowering of the skier's heel. Ordinarily, in downhill skiing and jumping, or the like, it is considered desirable to have the plate secured firmly to the skis.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

Fig. 1 is a side elevational view of the present ski-harness with the touring plate in locked position.

Fig. 2 is a top plan view of same.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmentary view in side elevation of a preferred ankle strap construction.

Fig. 6 is an end elevational view of same.

Fig. 7 is a side elevational view of the ski-harness showing the touring plate in elevated position.

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Fig. 8 is a top plan view of the ski-harness showing the mode of operation of the heel and toe pivot mechanisms.

Referring now more particularly to the drawings, there is indicated a fragment of a conventional ski 11 upon which the present harness is mounted. A toe pivot, comprising a raised plate 12 provided with an upwardly projecting pivot pin 13 having an eyelet 14, is secured to the top of the ski. Bifurcated toe engaging element 16 having a hook-like portion 15 engageable loosely in eyelet 14 is adapted to swing pivotally about the axis of pin 13, and by virtue of its loose engagement with eyelet 14 is also movable upwardly and downwardly. Projecting ends 17 of bifurcated member 16 are proportioned for insertion into suitable slots or notches 18 formed in the toe portion of a skier's boot. The toe pivot construction per se, hereinabove described, is considered conventional, and a generally similar mechanism is disclosed in U. S. Patent No. 2,236,874, dated April 1, 1941, Hjalmar Hvam, patentee.

The present ski-harness also incorporates a tensioning cable assembly which may be of more or less conventional construction. In the drawings the cable assembly is illustrated as comprising a wire cable 19 provided with an enlarged heel engaging portion 21 formed in the nature of a coil spring, and a suitable toggle-actuated tensioning and tensioning-release mechanism 22. The purpose of the tensioning cable is to provide means for urging a skier's boot forwardly into secure contact with ends 17 of the toe pivot member 16.

The touring plate assembly, mentioned briefly heretofore, comprises more specifically a heel plate 23 formed in the nature of an upwardly facing channel piece defining a web portion 24 and a pair of upwardly extending side members 25 and 26, respectively. Plate 23 is attached pivotally by pin 27 to cross-bar 28, which said latter named element, in turn, is mounted securely on the rearwardly extending ends of arms 29 and 31 which are each hinged as at 32 and 33 to opposite side edges of the ski.

Cross-bar 28 is formed with a rearwardly projecting flange portion 34 cooperable with locking mechanism 36 to permit locking and unlocking of the touring plate assembly with respect to the ski. More specifically, locking mechanism 36 is shown as comprising an anchor plate 37 secured to the ski, on which is mounted slidably a lock-

ing plate 38 formed with a longitudinal slot 39 through which projects a suitable bolt and lock nut 41. When plate 38 is moved slidably forwardly to overlap flange 34, the touring plate assembly will be secured firmly to the top of the ski; and conversely, when said locking plate is moved rearwardly, the touring plate assembly comprising arms 29 and 31, cross-bar 28, and heel plate 23 are free to move upwardly and downwardly about hinges 32 and 33.

Referring now more particularly to Figs. 5 and 6, it is seen how ankle strap 42 is provided with a rectangular loop 43 (formed of relatively heavy spring material) terminating in a substantially circular split ring 44 adapted for "snap-on" engagement with associated pin 46 provided on side 26 of the heel plate. Obviously, the other end of heel strap 42 may also be connected releasably by similar fastening means to side 25 of the heel plate. The construction of the split-ring and pin assembly is such that only ordinary pull exerted on ankle strap 42 during normal skiing movement will not be sufficient to cause releasable disengagement of the snap-on split-ring from the pin. On the other hand, these elements are fashioned to releasably disengage from one another upon the ankle strap being subjected to what may be termed abnormal or unusual pull, such as may occur when a skier falls in a manner whereby his legs tend to pull strongly in a direction away from the skis.

The heel and toe pivot mechanism, heretofore described in detail, cooperate to allow a skier's boot to rotate within the harness when undue torsional stress or twisting of a skier's leg occurs. For example, Fig. 8 illustrates how the heel of the boot can pivot with heel plate 24, thereby causing the toe end of the boot to swing laterally outwardly from engagement with toe engaging element 16. Fig. 8 shows the ski-harness with the tensioning cable and ankle strap removed, but it is believed readily understandable that as soon as the toe of a skier's boot has swung outwardly clear of the toe pivot, tension on the cable will be released by virtue of the fact that the skier's boot is free to move forwardly (at least as far as the ankle strap will permit limited forward movement of the boot within the harness). As heretofore explained, if the forward pull on the boot is unusually great, the ankle strap will disengage from the heel plate, and the skier's boot will become entirely free of the harness.

From the foregoing explanation, it is seen how the various elements comprising the present ski-harness cooperate with one another to provide safety means for both releasing entirely a skier's boot from the harness and/or for allowing a skier's boot to turn within the harness relative to the ski, depending on the degree and type of abnormal torsion or pull transmitted to the mechanism.

As has been heretofore indicated, the hinged touring plate permits employment of an ankle strap, and at the same time provides a means by which a skier may raise and lower his heel with respect to the ski in a natural walking manner. In climbing up hill or in skiing down hill or jumping, it is usually considered desirable to lock the touring plate by means of fastening elements 34 and 38 whereby elevation of the touring plate is prevented.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

I claim:

1. A ski harness comprising; a toe pivot mounted on a ski comprising a toe engaging element swingable laterally to either side of said ski, a heel plate mounted pivotally about an axis disposed normal to the top surface of said ski spaced rearwardly of said toe pivot for supporting pivotally a heel of a skier's boot, an ankle strap provided on said heel plate, a tensioning cable adapted to urge a skier's boot forwardly into engagement with said toe pivot, and a safety release mechanism incorporated in said ankle strap, said safety release means comprising a split-spring normally detachably embracing and retaining a complementary fastening element comprising a pin, the spring tension of said spring retaining member being such as to disengage from said ankle strap upon abnormal pull being exerted on said ankle strap in a direction away from said ski.

2. A ski harness for supporting a skier's boot on a ski comprising; a toe release mechanism mounted on a ski adapted to releasably engage the toe portion of a skier's boot, a heel plate mounted pivotally about an axis disposed normal to the top surface of said ski for supporting pivotally a heel of a skier's boot, the forward edge of said heel plate being spaced rearwardly of said toe release mechanism a distance approximately equal to the distance between the forward edge of the heel and the toe of the boot which the harness is adapted to support, an ankle strap provided on said heel plate, and means adapted to urge said skier's boot forwardly into engagement with said toe release mechanism.

3. A ski harness according to claim 2 and wherein said last named means comprises a tensioning cable engageable about the heel of a skier's boot to urge said boot forwardly into engagement said toe release mechanism.

4. A ski harness according to claim 2 and wherein said toe release mechanism comprises a toe pivot including a toe engaging element swingable laterally to either side of said ski adapted to releasably engage the toe of a skier's boot.

5. A ski harness comprising; a toe release mechanism mounted on a ski adapted to releasably engage the toe portion of a skier's boot, a heel plate mounted pivotally about an axis disposed normal to the top surface of said ski spaced rearwardly of said toe release mechanism for supporting pivotally a heel of a skier's boot, an ankle strap provided on said heel plate, means adapted to urge a skier's boot forwardly into engagement with said toe pivot, and safety release means incorporated in said ankle strap, said safety release means comprising a split-spring normally detachably embracing and retaining a complementary fastening element comprising a pin, the spring tension of said spring retaining member being such as to disengage from said ankle strap upon abnormal pull being exerted on said ankle strap in a direction away from said ski.

6. A ski harness for supporting a skier's boot on a ski comprising: a toe release mechanism mounted on a ski adapted to releasably engage the toe portion of the skier's boot; a touring plate including a heel portion, and a forwardly projecting member hinged to said ski between the heel and toe extremities of the ski harness; the

heel supporting member of said touring plate swingable upwardly and downwardly about the axis of said hinge relative to the top surface of said ski; a heel plate for supporting the heel of said boot mounted pivotally on said heel portion of said touring plate about an axis disposed normal to the top surface of said ski; the forward edge of said heel plate spaced rearwardly of said toe release mechanism a distance approximately equal to the distance between the forward edge of the heel and toe of the boot which the harness is adapted to support; an ankle strap provided on said heel plate; and means for urging said boot forwardly into engagement with said toe mechanism.

7. A ski harness according to claim 2 and wherein upwardly extending flange means are provided on opposite sides of said heel plate for engaging opposite sides of the heel portion of a skier's boot to prevent lateral movement of said boot relative to said plate.

8. A ski harness according to claim 6 and wherein releasable locking means are provided for detachably securing the heel portion of said touring plate in adjacent overlying position with respect to the top of said ski.

9. A ski harness according to claim 6 and wherein a safety release mechanism is incorporated in said ankle strap operable to disengage said ankle strap from the ski boot normally secured by said strap upon abnormal pull being exerted on said strap in a direction away from said ski.

10. A ski harness for supporting a skier's boot on a ski comprising: a toe release mechanism mounted on a ski adapted to releasably engage the toe portion of a skier's boot; a touring plate including a heel portion, and a forwardly projecting member hinged to said ski between the heel and toe extremities of the ski harness; the heel portion of said touring plate swingable upwardly and downwardly with respect to the top

surface of said ski about the axis of said hinge; a heel plate for supporting the heel of a said boot mounted pivotally on the heel portion of said touring plate about a pivotal axis disposed normal to the top surface of said ski; the forward edge of said heel plate being spaced rearwardly of said toe release mechanism a distance approximately equal to the distance between the forward edge of the heel and the toe of the boot which the harness is adapted to support; upwardly extending flange means provided on opposite sides of said heel plate for engaging opposite sides of a ski boot and preventing lateral movement of said boot with respect to said heel plate; an ankle strap provided on said heel plate; safety release means incorporated in said ankle strap operable to disengage from a boot normally secured by said ankle strap within the harness upon abnormal pull being exerted on said ankle strap in a direction away from said ski; means for urging the skier's boot forwardly into engagement with said toe release mechanism; and means for detachably securing the heel portion of said touring plate in adjacent overlying position with respect to the top of said ski.

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