May 29, 1951 J. I. JOHANSEN 2,554,706

SAFETY SKI BINDING

Filed May 28, 1947

Fig. 1.

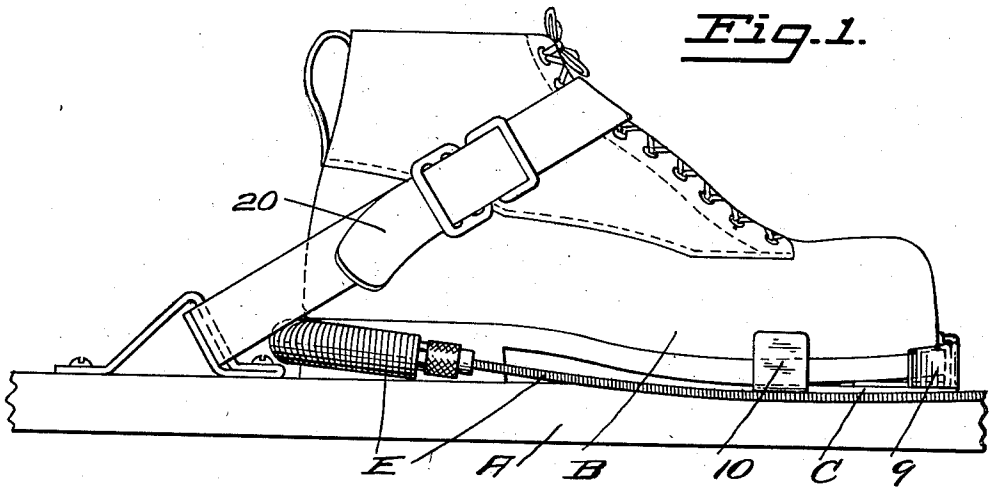


Fig. 2.

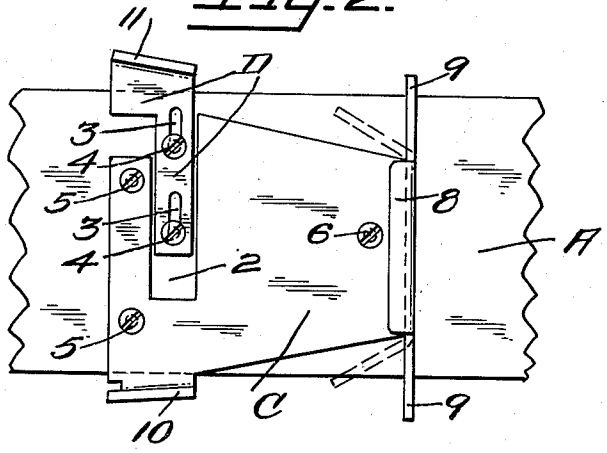
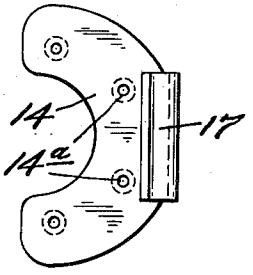


Fig. 4.



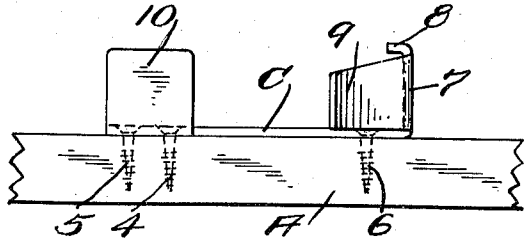
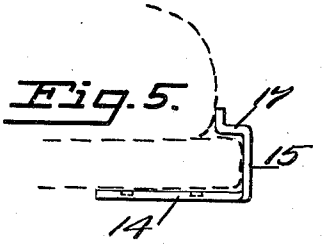


Fig. 3.

Fig. 5.



INVENTOR.
JOHN I. JOHANSEN.
BY Thomas Castberg
ATTORNEY

Patented May 29, 1951

2,554,706

UNITED STATES PATENT OFFICE

2,554,706

SAFETY SKI BINDING

John I. Johansen, Soda Springs, Calif.

Application May 28, 1947, Serial No. 750,940

3 Claims. (Cl. 280—11.35)

1

This invention relates to a safety ski binding particularly designed to release the ski boot with relation to the binding when abnormal stresses are encountered as when a skier falls.

The object of the present invention is generally to improve and simplify the construction and operation of ski bindings of the character described; to provide a binding which is readily applied to skis and easily fitted with relation to ski boots of various sizes; and further, to provide a binding which rigidly secures the ski boots in place and in alignment with the skis under all normal conditions of skiing, but automatically releases the boots with relation to the bindings when abnormal stresses are encountered as when a skier falls, such release materially reducing the chances of strains, twists and bone fracture.

The ski binding is shown by way of illustration in the accompanying drawings in which:

Fig. 1 is a side elevation of a portion of a ski showing the ski binding and the ski boot in place;

Fig. 2 is a plan view of a toe iron applied to a ski;

Fig. 3 is a side elevation thereof;

Fig. 4 is a plan view of a toe guard; and

Fig. 5 is a side elevation thereof.

Referring to the drawings in detail, and particularly Fig. 2, a toe iron is shown which is composed of two separable and adjustable plates indicated at C and D. Plate C has a slot 2 formed adjacent its rear end to receive the plate D and as this plate has slots 3—3 formed therein and is secured to the ski as indicated at A by means of screws 4—4, lateral adjustment between the plates is provided.

Plate C is secured to the ski by screws 5—5 and 6. This plate tapers in a forward direction and the front end is bent at right angles to form a vertical member 7 with a shoulder 8 formed at its upper end. A pair of side lugs 9—9 are provided and their function will hereinafter be described. Each plate also has a side flange as indicated at 10 and 11, respectively.

In Figs. 4 and 5, a toe guard is shown. This guard comprises a plate 14 which conforms somewhat to the shape or outline of the toe end of the sole of a ski boot. The front end of the plate is bent at right angles to form a vertical member 15 which protects the toe end of the sole of the boot, and this plate is bent at the upper end to extend inwardly and over the front edge of the sole to form a shoulder 17, the function of which will later be more fully described.

The toe irons are applied to the skis as shown in Figs. 2 and 3, and a toe guard such as shown

2

in Figs. 4 and 5 is applied to the toe end of each ski boot by screws or other suitable fastening means passing through perforations 14a formed in plate 14. It will also be understood that each ski is provided with a standard cable binding such as shown at E in Fig. 1, said binding embracing the heel of the ski boot indicated at B and then extending forward to the usual adjustable clamp whereby the cable may be tightened or released.

In actual practice when the toe irons and the toe guards have been applied to the skis and boots respectively, and the plates C and D have been adjusted to the width of the boots, it is obvious that when the toe of a boot is placed on the toe iron and shoved forward thereon that the shoulder 17 of the toe guard will engage and extend in under the shoulder 8 of the toe iron. Then by applying the cable binding and properly adjusting it, the toe guard of each boot will be held against the front end of the toe iron and the pressure exerted may be adjusted as practice may dictate. Finally by bending the lugs 9—9 rearwardly against the sides of the sole as shown in dotted lines in Fig. 2, fitting of the binding will be completed.

The shoulder 8 of each toe iron extends over the shoulder 17 of the toe guard a distance only of about one-sixteenth of an inch. This, together with the pressure exerted by the cable binding, is more than sufficient to secure the ski boots to the ski during all normal conditions of skiing, whether running downhill, slaloming, jumping or otherwise, but when an abnormal strain is applied as when taking a fall during high speed, the toe guard becomes disengaged with relation to the shoulder 8 and the boot is released with relation to the binding and the ski, thus materially reducing the chances of broken legs, twisted knees, sprains and like injuries.

By referring to Fig. 1, it will be noted that an ankle strap 20 is employed. This is very desirable as it is essential to hold the heels of the boots against the skis or in other words provide a solid downhill tension on the boots thereby providing additional control, security and ease, particularly when making quick turns in slaloming runs. The ankle strap is adjustable as shown and may be slackened sufficiently to permit the heels of the boots to rise when skiing cross-country or touring. By using the ankle strap in combination with the toe irons here shown, the cable binding need not be as tight as when used with ordinary toe irons as the cable binding is only tight enough to hold the toe guards in engagement with the retaining shoul-

ders 8 on the toe irons, that is for all normal skiing, but the cable is slack when compared to ordinary practice and as such permits release of the toe guards under abnormal conditions. That is, the slack in the binding cable is not enough normally to permit disengagement, but under excessive strain is enough to permit the ski boot to shift rearwardly with respect to the ski so that the shoulder 17 on the toe guard slips rearwardly and out from under the shoulder 8 of the toe iron thus disengaging these parts and so releasing the front of the ski boot from the ski. If the ankle strap is used with ordinary bindings, it increases the hazard when taking a fall, but when used in combination with the safety binding here shown, it serves the usual purpose without increasing the hazard and furthermore keeps the ski loosely attached to the boots when they are released from the bindings thus preventing the ski from running away when taking a fall.

While the toe irons and toe guards here shown are more or less specifically illustrated and described, it is understood that changes may be resorted to within the scope of the appended claims and that the materials and finish of the several parts employed may be such as the experience or judgment of the manufacturer may dictate or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A ski binding comprising a first plate secured to a ski, said plate being bent substantially vertically at its forward end and terminating in a horizontal, rearwardly extending, transverse retaining shoulder at the upper end of the vertical portion, a second plate secured to the ski for lateral motion with respect to said ski, a vertical lug on each of said plates to engage the respective sides of the sole of a ski boot, a toe guard secured to the toe end of the sole of the ski boot, said toe guard having a horizontal transverse shoulder adapted to move longitudinally in under the horizontal retaining shoulder on the first plate, and resilient means for longitudinally pressing the shoulder of the toe guard in under the retaining shoulder.

2. A ski binding comprising a plate secured to a ski, said plate being bent substantially vertically at its forward end and then being bent rearwardly to terminate in a horizontal retaining shoulder at the upper end of the vertical portion, a toe guard secured to the toe end of the sole of the ski boot, said toe guard having a horizontal shoulder adapted to move longitudinally in under the retaining shoulder on the plate, side lugs on the plate in position to engage the opposite sides of the sole of the ski boot, and resilient means for longitudinally pressing the shoulder of the toe guard into a forward position in engagement with and beneath the retaining shoulder and with the toe guard against the vertically bent portion of the plate.

3. A ski binding comprising a plate secured to a ski, said plate being bent substantially vertically at its forward end and then rearwardly to form a horizontal retaining shoulder at the upper end of the vertical portion, said plate and shoulder defining a rearwardly open transverse channel, a toe guard secured to the toe end of the sole of a ski boot, said toe guard having a horizontal shoulder which extends in under the retaining shoulder, resilient means for pressing the shoulder of the toe guard longitudinally forward into engagement with the retaining shoulder, and a pair of side lugs on the plate in positions to engage opposite sides of the sole of the ski boot.

JOHN I. JOHANSEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,338,249	Jansen	Jan. 4, 1944

FOREIGN PATENTS

Number	Country	Date
173,925	Germany	July 30, 1906
215,681	Switzerland	Oct. 16, 1941