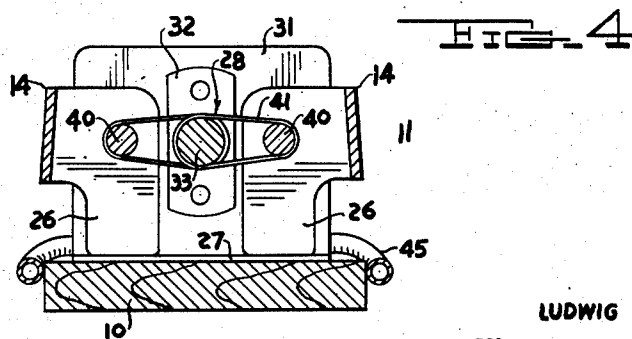


2,517,795

2 Sheets-Sheet 1



Whittemore, Hubbard & Bellamy
ATTORNEYS.

Aug. 8, 1950

L. A. MAJNERI
SKI BINDING

2,517,795

Filed Nov. 24, 1947

2 Sheets-Sheet 2

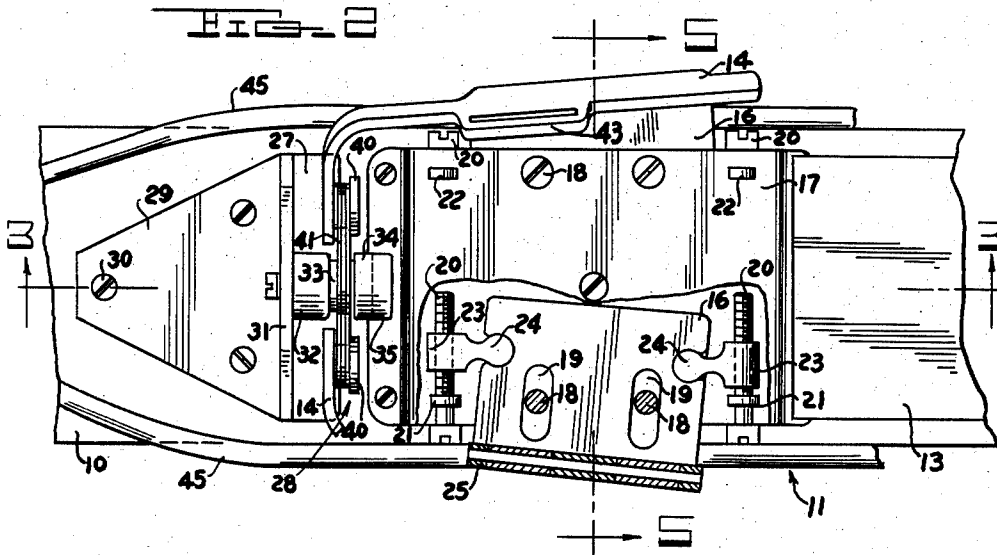
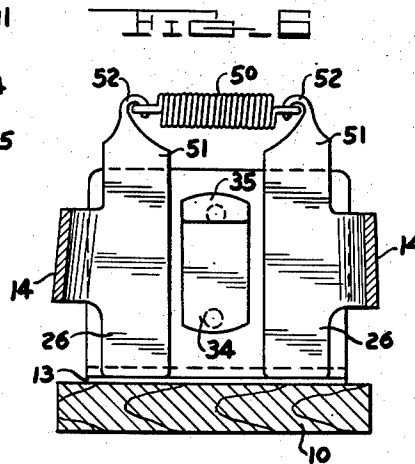
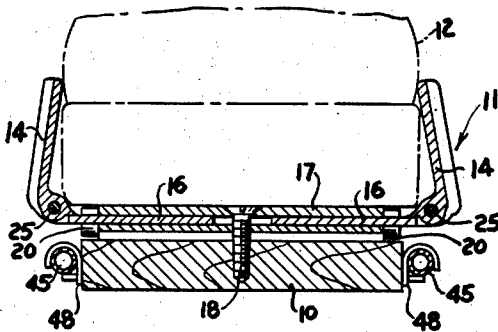


FIG. 4



INVENTOR.
LUDWIG A. MAJNERI.

BY

Whitmore Kullback & Bellhop
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,517,795

SKI BINDING

Ludwig A. Majneri, Grosse Pointe, Mich.

Application November 24, 1947, Serial No. 787,808

11 Claims. (Cl. 280—11.35)

1

This invention relates generally to ski bindings, and refers more particularly to improvements in bindings of the type having provision for clamping the toe as well as the heel of a boot to a ski.

Ski bindings of the above general type are usually designed to firmly hold a boot on a ski against movement relative to the ski either transverse or longitudinally of the ski and may be adjusted to afford very little lift of the boot heel. Although ski bindings capable of firmly holding a boot on a ski are a prerequisite to advanced skiing, nevertheless, they are dangerous, especially for beginners and are the direct cause of many leg breaks.

Leg breaks during skiing may result when the strain on the feet of the skier reaches a point where the leg bone of the skier breaks, and it is an object of this invention to provide a binding which will release the boot before this point of strain is reached.

A more detailed object of this invention is to provide a ski binding having toe irons adapted to clamp a boot therebetween and relatively movable to release the boot in response to the application of an abnormal or a predetermined force on one or both toe irons in a generally outward direction.

Another object of this invention is to provide a ski binding having releasable means for holding the relatively movable toe irons in their boot clamping positions with a force which may be readily varied to suit the strength characteristics of the particular skier using the binding. One way of accomplishing the above result is to tie the toe irons together with a breakable cord wrapped around the toe irons with a number of turns, depending on the strain point at which it is desired to break the cord and release the toe irons from clamping engagement with the boot.

Still another feature of this invention is to provide a ski binding wherein one or both of the side toe irons are hinged to a supporting member for outward swinging movement and wherein the releasable means serve to normally hold the toe irons in their upright or boot clamping positions.

A further object of this invention is to provide a ski binding wherein the hinged side toe irons are positively located in their upright or boot clamping positions by stop means in the form of projections depending from the front ends of the toe irons and engageable with a supporting member on the ski.

A still further object of this invention is to provide a ski binding of the above general type,

2

wherein a plate extends upwardly from the supporting member at the front end of the boot, and in addition to having provision for engagement with the sole of the boot for holding the same down against the supporting member, further provides an anchorage around which the breakable cord or linear element for the toe irons may be wound. Thus the toe irons may be individually tied to the anchorage with different numbers of turns of the cord, and as a result, the force required to release one toe iron may be different than the force necessary to release the other.

The foregoing as well as other objects will be made more apparent, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is a side elevational view of a ski binding constructed in accordance with this invention;

Figure 2 is a fragmentary plan view partly broken away of the ski binding shown in Figure 1;

Figure 3 is a longitudinal sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a cross sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 2; and

Figure 6 is a cross sectional view of a modified form of construction.

Referring now more in detail to the drawing, it will be noted that the reference character 10 designates a conventional ski and the numeral 11 indicates generally a binding for securing an orthodox ski boot 12 to the ski. The binding 11 comprises a supporting member or base plate 13 attachable to the ski in the usual manner by suitable fastener elements and adapted to form a support for the boot 12.

In accordance with orthodox practice, the toe portion of the boot 12 is clamped in place on the ski 10 by a pair of toe irons in the form of elongated plates 14, respectively carried by a toe plate 15 shown in Figure 3 of the drawings as secured to the ski at the front end of the supporting member 13. Referring now to Figure 2 of the drawings, it will be noted that the toe irons converge from the rear end of the toe plate, and are inclined inwardly with respect to the opposite sides of the boot to actually wedge the toe portion of the boot in position on the ski.

In many instances it is desirable to provide a construction which enables adjusting the angle of convergence of the toe irons to compensate for different types of boots, and to assure proper-

3

ly clamping a particular boot in place. One construction used in the past for accomplishing the above result is to provide laterally inwardly extending flanges 16 at the bottom edge of each toe iron. These flanges are slidably supported on the toe plate 15, and are normally concealed by a cover plate 17 suitably secured in place by fastener elements in the form of screws 18. Certain of the screws 18 pass through elongated slots 19 formed in the flanges 16 to enable the unobstructed pivotal movement of the flanges 16 required to adjust the angular relation of the toe irons relative to the boot. The desired adjustment of the toe irons is effected by suitable screws 20 arranged in pairs with one pair associated with each flange 16. As shown in Figure 2 of the drawings, the screws 20 of each pair are respectively positioned at opposite ends of the associated flange 16, and the heads of the two pairs of screws are respectively accessible for manipulation from opposite sides of the binding. Each screw 20 is formed with an enlarged annular portion 21 having the top part extending into a suitable slot 22 formed in the cover plate 17, and having the bottom part engaging the toe plate 15. Thus the screws 20 are anchored against axial movement relative to the toe plate. Threadably mounted on each screw 20 is a nut 23 having a laterally inwardly extending projection 24 pivotally connected to the adjacent edge portion of the associated flange 16. The arrangement is such as to enable the toe irons to be moved bodily inwardly or outwardly or to be angularly adjusted by proper manipulation of the screws 20.

In the present instance the toe irons 14 are respectively connected to the outer edges of the flanges 16 by hinges 25 enabling the toe irons 14 to be swung laterally outwardly from their upright or boot clamping positions shown in Figures 1 to 5 inclusive of the drawings. The toe irons 14 are located in their upright or boot clamping positions by suitable stop means associated with the front end portions of the toe irons. In detail the front ends of the toe irons are turned inwardly beyond the toe of the boot and are provided with depending projections 26. The projections 26 are adapted to rest against a suitable bearing plate 27 secured to the top surface of the ski in a position in advance of the toe plate 15. The arrangement is such that when the projections 26 engage the bearing plate 27 in the manner shown in Figure 4 of the drawings, the toe irons are located in their proper clamping positions with respect to the toe of the boot.

Inasmuch as the toe irons cooperate with one another to clamping the toe portion of a boot in position on the ski, it follows that some means must be provided for holding the toe irons against outward swinging movement from their respective boot clamping positions. In general this is accomplished herein by releasable means 28 adapted to resist outward swinging movement of the toe irons with a force predetermined to effectively hold the toe irons in their boot clamping positions during normal skiing maneuvers, but less than any strain that may result in breaking the leg of the user. In detail a bracket 29 is secured to the ski 10 against the plate 27 by screws 30, and is provided with an upstanding flange 31 at the rear end thereof. The upstanding flange 31 is positioned forwardly beyond the toe irons and extends transversely of the ski at such an elevation to protect to some extent the toe portion of the boot clamped between the

4

toe irons. A fitting 32 is secured to the rear face of the flange 31 between the front end portions of the toe irons 14 and is provided with a rearwardly extending post 33. The post 33 is located midway between the front end portions of the toe irons and has an enlargement 34 at the rear end formed with a lip 35. The enlargement 34 acts as a stop to limit forward movement of the boot relative to the binding, and the lip 35 is adapted to engage the top surface of the sole of the boot to prevent upward displacement of the toe of the boot relative to the binding.

The inwardly curved front end portion of each toe iron is provided with a rearwardly extending projection 40, and these projections are adapted to assume positions laterally opposite from the post 33 when the toe irons are in their boot clamping positions shown in Figure 4 of the drawings. In the present instance the projections 40 are tied to the post 33 by a flexible, non-resilient linear member in the form of a cord 41. If desired the cord 41 may first be tied to the post 33 and may then be wound around the projections 40 as well as the post 33 to secure the toe irons in their upright or boot clamping positions. The number of strands of the cord used to secure the toe irons in operative position is so determined with respect to the strength of the cord that the latter will release or break upon the application of an abnormal laterally outward force against one or both of the toe irons. The arrangement should be such that if for any reason the boot 12 is twisted in one direction or the other during skiing, the cord 41 will break before the strain on the leg of the user reaches the breaking point. It will, of course, be understood that the cord 41 may be wound with more turns connecting one toe iron to the post 33 than the number of turns connecting the other toe iron to the post, so that the latter toe iron will be released first. In fact various different arrangements may be resorted to to suit the wishes of the user. As another example, the cord need not be wound around the center post 33 in which event it merely acts as a tie between the two toe irons. In any case the releasable means 28 acts as a safety device to minimize the danger of unduly straining or breaking the skier's legs. Attention may be called to the fact at this time that the number of turns or strands of the cord used to connect the toe irons together or to the center post 33 may be varied depending upon the strength of the legs of the particular user. This feature renders it possible to obtain the maximum safety for the particular user without altering the design or construction of the binding.

As shown in Figures 1 to 3 inclusive, the toe irons are provided with upstanding lugs 43 at the top edges thereof, and these lugs are slotted to receive a suitable toe strap not shown. This toe strap may be used in the field to temporarily secure the toe irons in their operative positions after the cord 41 has released the toe irons. However, the cord 41 may be very quickly replaced, and this practice is preferred from the standpoint of safety.

The means selected herein for holding the heel portion of the boot down against the ski is of orthodox design. In general this means comprises a cable 45 having a length of coil spring 46 at the rear end for engagement in the usual groove formed in the heel of the boot. The front end of the cable is adjustably connected to a conventional releasable clamp 47, which is suit-

5

ably secured to the ski 10 in advance of the boot 12. The opposite sides of the cable are attachable to the ski by suitable guide brackets 48 and the extent of hold-down may be varied by adjusting the guide brackets toward and away from the heel of the boot.

The embodiment of the invention shown in Figure 6 differs from the first described form of the invention in that the releasable means for holding the toe irons in their operative positions is in the form of a coil spring 50. In this construction the inwardly curved front end portions of the toe irons may be provided with upstanding lugs 51 terminating at the upper ends in hooks 52 for connection with opposite ends of the spring 50. The strength of the spring is such as to permit outward swinging movement of the toe irons to release the boot in response to the application of abnormal laterally outwardly directed force against the toe irons. In this connection it will also be noted that the hook portions will release the spring upon initial outward swinging movement of the toe irons, so that the clamping action of the latter on the boot is definitely destroyed. With the above exception the construction may be identical to the one previously described, and corresponding parts are indicated by the same reference numerals.

What I claim as my invention is:

1. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported at opposite sides of the part, stop means on the toe irons for limiting inward swinging movement of the toe irons and for locating the toe irons in a substantially upright position, a member located between the toe irons and fixed against swinging movement with said toe irons, and a non-yielding connection between the irons and said member constituting the sole means for holding the toe irons in said upright position and separable in response to the application of a predetermined force in an outward direction on the toe irons.

2. A ski binding comprising a part attachable to a ski, toe irons carried by the part in lateral spaced relationship to clamp a boot therebetween and relatively movable to release the boot, and a non-yielding tie between the toe irons constituting the sole means for holding the toe irons in their relative boot clamping positions and separable in response to the application of a predetermined force in an outward direction on one of the toe irons.

3. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported on said part in lateral spaced relationship and normally located in a substantially upright position to clamp a boot therebetween, stop means for positively preventing inward swinging movement of the toe irons from the upright positions thereof, and a non-yielding tie between the toe irons normally resisting outward swinging movement of the toe irons and breakable in response to the application of a predetermined force on one or both of the toe irons in a generally outward direction.

4. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported on said part in lateral spaced relationship and normally located in a substantially upright position to clamp a boot therebetween, stop means for positively preventing inward swinging movement of the toe irons from the upright positions thereof, and means normally resisting outward swinging movement of the toe irons in-

6

cluding a length of cord connecting the toe irons and adapted to break in response to the application of a predetermined force on one or both of the toe irons in a generally outward direction.

5. A ski binding comprising a part attachable to a ski, toe irons carried by said part in lateral spaced relationship to clamp a boot therebetween, means hingedly supporting one of the toe irons on said part enabling outward swinging movement of the latter toe iron from the boot, and means normally holding the hinged toe iron in its clamping position relative to the boot including a flexible nonresilient linear member breakable to release said hinged toe iron in response to the application of a predetermined force on the hinged toe iron in an outward direction.

6. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported on the part in lateral spaced relationship and normally located in a substantially upright position to clamp a boot therebetween, stop means for positively preventing inward swinging movement of the toe irons from the upright positions thereof, a member positioned between the toe irons at the front ends of the latter and fixed against swinging movement with the toe irons, and means resisting outward swinging movement of the toe irons including a non-yielding cord respectively connecting the toe irons to said upright member and breakable in response to the application of a predetermined force on the toe irons in an outward direction.

7. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported on the part in lateral spaced relationship and normally located in a substantially upright position to clamp a boot therebetween, stop means for positively preventing inward swinging movement of the toe irons from the upright positions thereof, a member positioned between the toe irons at the front ends of the latter and fixed against movement with said toe irons, a lateral projection extending from each toe iron adjacent the swinging edge thereof, and means resisting outward swinging movement of the toe irons including a linear element connected to said member and wound around the lateral projections on said toe irons, said element being breakable to release the toe irons in response to the application of a predetermined force on the toe irons in an outward direction.

8. A ski binding comprising a part attachable to a ski, a pair of toe irons respectively hingedly supported on the part in lateral spaced relationship and normally located in a substantially upright position to clamp a boot therebetween, stop means for positively preventing inward swinging movement of the toe irons from the upright positions thereof, a member having a lip adapted to overhang the sole of the boot at the front end of the latter and operable to hold the boot down on the ski, and means resisting outward swinging movement of the toe irons including a non-yielding connection between the toe irons breakable in response to the application of an abnormal force on the toe irons in an outward direction to release the toe irons from the boot.

9. A ski binding comprising a part attachable to a ski, a toe iron hingedly supported at its bottom edge on said part, a member fixed against pivotal movement with the toe iron, and a breakable tie between the toe iron and member constituting the sole means for holding the toe iron in its upright position and breakable in response

7

to the application of an abnormal force in an outward direction against the toe iron to permit outward swinging movement of the toe iron from its upright position.

10. A ski binding comprising a part attachable to a ski, a pair of toe irons hingedly supported on said part in lateral spaced relationship and normally held in a substantially upright position to clamp a boot therebetween, a member fixed against movement with the toe irons and having a lip adapted to overhang the sole of the boot at the front end of the latter, means resisting swinging movement of the toe irons in an outward direction from their upright positions aforesaid including a flexible non-yielding linear member respectively connecting the toe irons to said member and breakable in response to the application of an abnormal force on the toe irons in an outward direction.

11. A ski binding comprising a part attachable to a ski, toe irons carried by said part in lateral spaced relationship to clamp a boot therebetween,

8

means hingedly supporting one of the toe irons on said part enabling outward swinging movement of the latter toe iron from the boot, and means normally holding the hinged toe iron in its clamping position relative to the boot including a flexible non-resilient tie between the toe irons and breakable to release the hinged toe iron in response to the application of a predetermined force in an outward direction on the hinged toe iron.

LUDWIG A. MAJNERI.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,553,475	Schiess	Sept. 15, 1925
2,199,937	Keller	May 7, 1940
2,373,128	McIlvaine	Apr. 10, 1945
2,381,793	Wallace	Aug. 7, 1945