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Zimmet

[11] **3,796,438**

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[54] **RUNAWAY BINDING ASSEMBLY FOR SKIS**

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[52] **U.S. Cl.** ..... **280/11.35 N**
[51] **Int. Cl.** **A63c 9/00**
[58] **Field of Search** .. 280/11.35 N; 343/900, 915 A

[56] **References Cited**

UNITED STATES PATENTS

3,452,999	7/1969	Salomon	280/11.35 N
3,549,163	12/1970	Wiedermann	280/11.35 N
2,793,869	5/1957	Braun	280/11.35 N

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Attorney, Agent, or Firm—Hubbell, Cohen & Stiefel

[57] **ABSTRACT**

A runaway binding assembly for skis comprising an elongated member, having opposing ends and means for connecting one end of said elongated member to a ski with the member in a desired normal position, said member being resiliently deformable in a plurality of directions from said normal position; and a locking member for releasably locking the other end of the elongated member therein. The locking member is securable to a skier such as, for example, by being directly attached to a ski boot or by being bound about such boot or the skier's leg.

2 Claims, 5 Drawing Figures

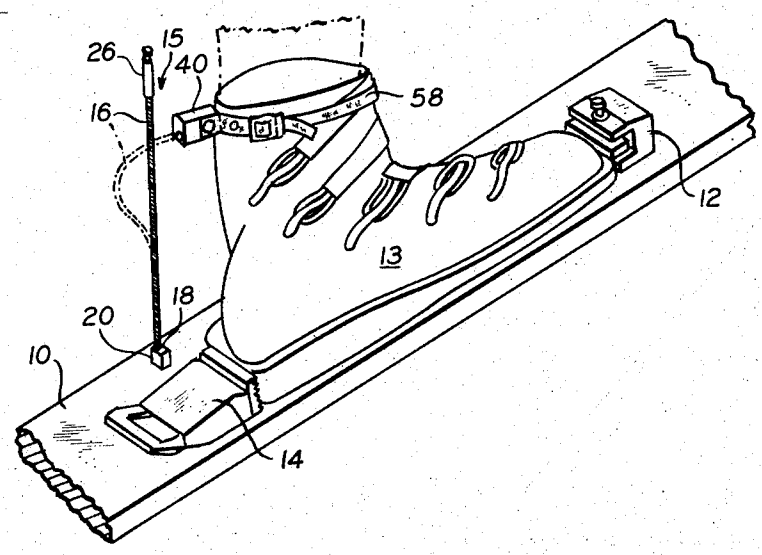


FIG. 1.

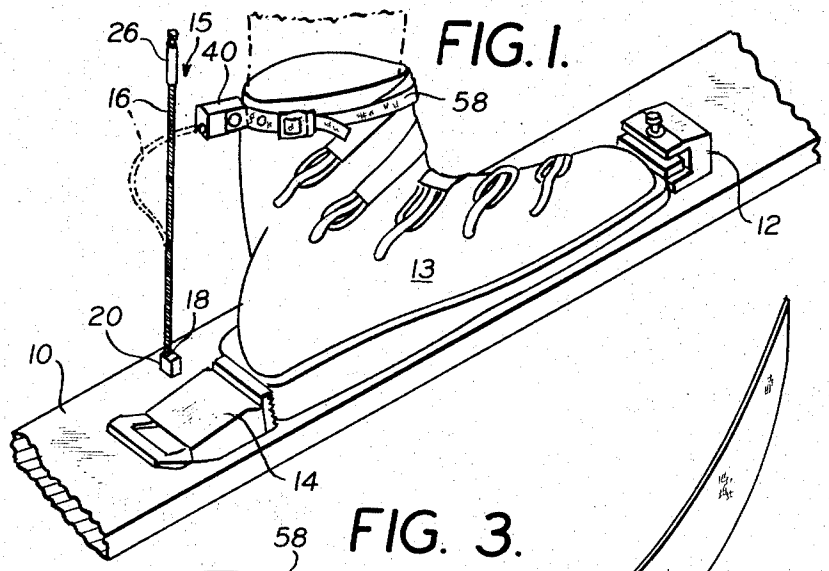


FIG. 2.

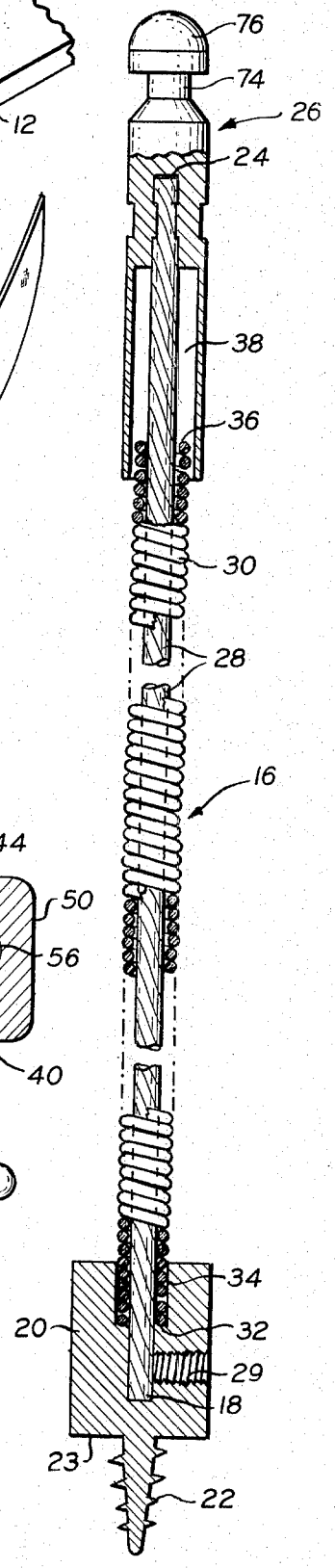


FIG. 3.

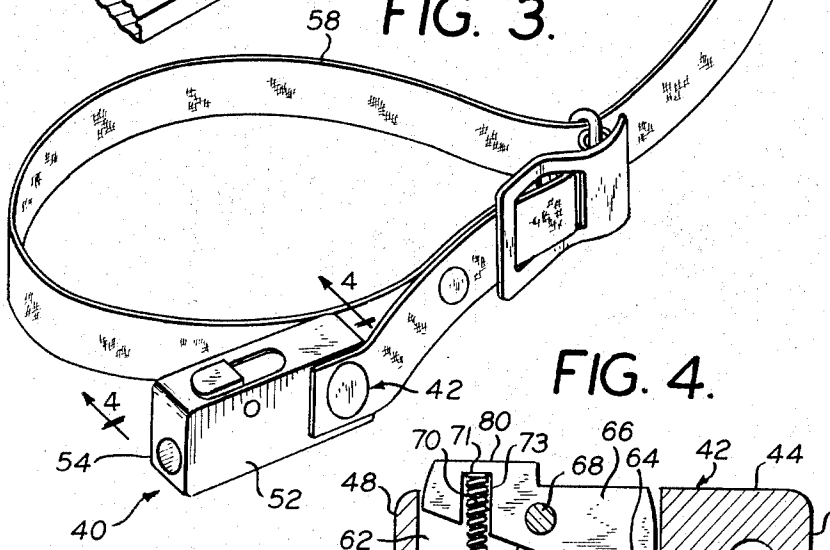


FIG. 4.

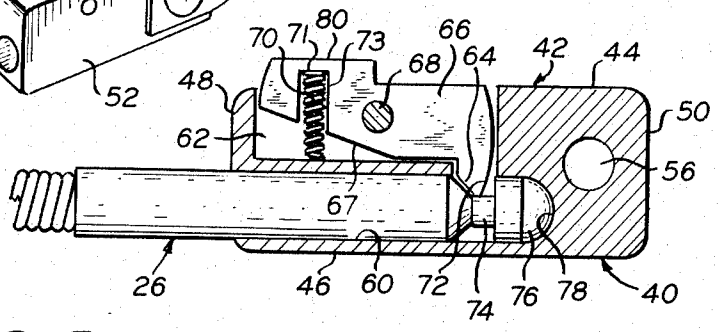
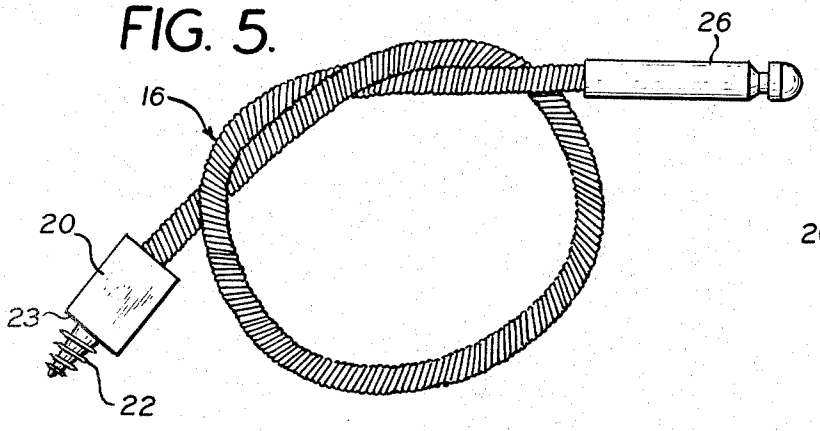


FIG. 5.



RUNAWAY BINDING ASSEMBLY FOR SKIS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to runaway bindings for skis for preventing the total unintentional separation of a ski from the skier in the event of release of a ski boot from the main ski binding.

2. Description of the Prior Art

In skiing, it is desirable that the ski equipment include a safety release binding which rigidly holds the boot to the ski, but which permits disengagement upon predetermined force, torque or impact levels being reached, whereby to reduce the likelihood of injury to the skier. When a ski becomes disengaged from a boot, it is free to slide down the hill as a dangerous missile to all in its path, unless there is a runaway binding. Thus some means for preventing the total separation of a ski from the skier should be provided in the event a ski boot is released from the main ski binding on the ski. Not only does such means prevent a loss of the ski, but it also prevents possible injury to persons located downhill of the skier.

Numerous methods and apparatus for preventing the separation of a ski from a skier are known in the art. Such apparatus is commonly referred to as a "runaway" binding. The most common runaway binding makes use of a flaccid strap, usually fabricated of leather, which is permanently mounted at one end to a portion of the main ski binding or ski and which may be wrapped around and affixed to the ski boot at its other end.

This type of runaway binding has a number of drawbacks. For instance, the manner of wrapping the free end of the strap around the ski boot is a time-comsuming and often physically exhausting exercise. MOre specifically, the strap, being a flaccid member, normally lies on the ski on the ground thereby requiring the skier to bend all or substantially all the way down to the ground to pick up the strap and wrap it about his boot. As any skier will well known, the act of bending down to touch the ground is a very cumbersome and exhausting exercise when thhe skier's boot has already been locked into the main binding. Another disadvantage is that the straps, being generally fabricated of a leather material, wear out frequently. This is caused by a number of factors, such as by becoming water-logged and then drying-out, which repeating process causes the strap to become brittle and crack. This might lead to a break in the strap which, if occurring during an unintentional release, would enable the ski to separate from the skier. Another disadvantage of a runaway strap is that it tends to get caught under the ski whereby the ski edges cut into the strap.

In an effort to devise more efficient runaway bindings, numerous methods have been employed in the past. For example, one such method is disclosed in U.S. Pat. No. 2,933,324 issued on Apr. 19, 1960 to Stimler. Stimler uses a ski leash as a runaway binding having a line at one end connected to the ski and an elastic expandable line at the other end connected to the boot, such as at one of the buckles or loops thereof. The runaway binding of Stimler has never caught on commercially because the elastic line tends to wear out in the vicinity of the leash and also requires the skier to not only reach down to the ski to attach the runaway binding to the boot, but also to reach in front of him which is a very difficult maneuver to perform when both ski boots are locked into the main ski bindings.

Yet another approach to developing a replacement for the conventional runaway strap above-described is shown in U.S. Pat. No. 3,452,999 issued on July 1, 1969 to Salomon. In FIG. 1 of Salomon, the conventional leather strap has been partially replaced by a flaccid helically wound cable having one end mounted to the heel portion of the main binding and another end affixed to a loop through which a belt may be inserted, the belt being secured around the ski boot to thereby couple the cable to the boot. Although the cable is decidedly more wear resistant than the conventional leather strap, it still is a flaccid member which normally would be limp when not attached to the ski boot thereby still requiring the skier to bend substantially all the way down to the ground to pick up the belt and attach it to the boot.

Another attempt at providing alternatives to the conventional runaway strap can be seen in U.S. Pat. No. 3,594,163 issued on Dec. 22, 1970 to Wiedermann. Wiedermann's runaway binding is comprised of a substantially rigid member having one end pivotally mounted to the heel portion of the main binding and another end including a hole therein enabling the member to be engaged in a lock carried by the boot. In one embodiment of Wiedermann (FIGS. 10–13) the rigid member is concave in shape at its upper extent and is slightly resilient in a plane parallel to the ski edges and perpendicular to the ski upper surface. The upper end of the rigid member is brought into engagement with the lock on the boot by forcing down such end with the tip of the ski pole. Although this embodiment of Widermann is not subject to the wear of a conventional runaway strap assembly, it nonetheless requires a skier to bend down close to the ground to reach the rigid member to raise it for connection to the ski boot.

A more significant disadvantage of Wiedermann's device, however, arises from the rigidity thereof. More specifically, it is a stated purpose of the binding of Weidermann to prevent the ski from twisting or turning relative to the ski boot when the latter is released from the main ski binding. This is an extremely dangerous condition which any skier would well recognize. More specifically, it is essential to have completely free relative movement between the ski and ski boot when the latter is released from the former so that the skier does not break a leg. Such condition cannot be tolerated.

SUMMARY OF INVENTION

Generally speaking, this invention relates to a runaway binding assembly for skis comprising an elongated resilient member having opposing ends and means for securing said member to a ski in a desired normal position; said member being deformable (bendable) in a plurality of directions from said normal position and resiliently restorable thereto; and a locking member for releasably locking the other end of said elongated member therein. The locking member is securable to a skier such as for example, by being attached directly to a ski boot or by strapping it to the skier's leg. Alternatively, the locking means may be formed as an integral part of the ski boot. Preferably, the desired normal position of said elongate member is one upstanding from a ski.

A runaway binding assembly of this invention has a number of significant advantages over the prior art runaway bindings above-described. One main advantage is that the resilient member is normally upstanding when mounted to a ski. Thus, the skier need bend down only to a point significantly above the ground to grasp the upper end of the resilient member and then bend said member into a position enabling the locking of the upper end of said elongated member in the locking member. He need not bend all the way down to the ground as in the prior art. This makes the binding decidedly more facile and less time consuming to connect. Further, there is no danger of the member being caught under the skies thereby causing damage to both the runaway binding and the ski edges.

In accordance with this invention, when the ski boot is released from the main ski binding in a fall or the like, the upper end of the resilient member will be maintained locked in the locking means thereby preventing the detachment of the ski from the skier. Further, the ski is capable of free movement relative to the ski boot in substantially every direction since the resilient member is bendable in substantially every direction from its normally upstanding position. In other words, the resilient member is substantially "omnidirectionally resilient." Of course, when the upper end of the resilient member is released from the locking member, the resiliency of said member will return it to its normal upright position.

In a preferred embodiment of this invention, the normally straight and upstanding resilient member includes a flaccid cable having opposing ends defining the opposing ends of said member, and spring means coupled to the cable for maintaining said cable in a normally straight and upstanding condition while permitting resilient bending of the cable in substantially any direction from its normal upstanding position.

These and other aspects and advantages of this invention are more clearly described below with reference to the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary perspective view of a ski showing a ski boot locked onto a main binding and further showing a runaway binding assembly of this invention;

FIG. 2 is a fragmentary sectional view of one element of the runaway binding assembly shown in FIG. 1;

FIG. 3 is a perspective view of two other elements of the runaway binding assembly of FIG. 1;

FIG. 4 is a cross sectional view of one of the elements shown in FIG. 3 taken along lines 4—4 of FIG. 3; and

FIG. 5 is a side elevation view of the element of FIG. 2 shown in a different position used when the ski is transported.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring to FIG. 1, a segment of a conventional ski 10 is shown having a conventional safety release binding comprised of a toe piece 12 and a heel piece 14. A conventional ski boot 13 is shown mounted to ski 10 in such safety binding 12–14.

In accordance with this invention, and with reference to FIG. 1, a runaway binding assembly 15 is employed to prevent the separation of ski 10 from the skier (whose leg is shown in phantom) upon release of the safety binding. Assembly 15 includes a preferably normally straight resilient member 16 (although it could be normally curved) having opposing ends 18 and 24 (FIG. 2). End 18 is secured within a mounting block 20 which preferably contains a screw 22 extending from a flat lower surface 23 thereof. Thus, block 20 may be screwed into ski 10 at a desired location.

Preferably, mounting block 20 is screwed into ski 10 at a location adjacent heel piece 14 of the main binding. So attached, member 16 will be normally upstanding from ski 10 by reason of its resiliency and its preferably normally straight configuration.

In accordance with this invention, resilient member 16 may be formed by any elongated resilient material or combination of materials having a normal configuration which is preferably substantially straight and which may be bent by a skier in any direction from its normal straight position and yet return to such normal position when all external forces are withdrawn. The reason for this will become apparent below.

Referring to FIG. 2, the preferred embodiment of resilient member 16 is shown in detail. More specifically, member 16 is comprised of a flaccid cable 28 which is preferably fabricated of a suitable metal or wound strands of metal and which has a lower end defining lower end 18 of resilient member 16 and an upper end defining upper end 24 of the resilient member. Thus, lower end 18 of cable 28 is embedded within mounting block 20 and may be held there as by a set screw 29. Upper end 24 of cable 28 is embedded within a lock engaging device 26 which shall be more completely described hereinafter.

In accordance with the presently preferred embodiment of this invention, resilient member 16 further includes a resilient helically wound metallic spring 30 which is wound about cable 28 and extends from a lower end 32 fixed within mounting block 20 to an upper end 36 slidably positioned within a cylindrical aperture 38 within lock engaging device 26.

Preferably, spring end 36 normally extends only partly into aperture 38 so as to enable relative motion between the cable and the spring when member 16 is deformed (bent). If no clearance were provided, it would be extremely difficult to bend member 16.

Helically wound spring 30 is constructed preferably to assume a straight position absent external forces and, as mentioned above, may be bent in any direction from its normal staight position. It is desirable that the degree of resiliency of spring 30 be such as to always return cable 28 to a normally straight position when all expected external forces have been withdrawn. Thus, when member 16 is mounted to a ski in the manner described above (FIG. 1), it will be normally upstanding due to the resiliency of spring 30. Even after being bent, it will return to a normal upstanding position (assuming no abnormally great force is encountered to bend member 16 past its elastic limit).

As shown in FIG. 1, runaway binding assembly 15 further includes a locking member 40 which is preferably attached to the upper periphery of the ski boot by means of a belt 58 which is capable of adjustment to a desired circumferential extent. Locking member 40 may alternatively be mounted directly to the ski boot itself, thereby eliminating the need for belt 58 or may be connected about the leg of a skier (shown in phantom) by means of belt 58.

Referring to FIGS. 3 and 4, the preferred form of locking member 40 will now be described in detail. Locking member 40 includes a generally solid housing 42 having a pair of opposing parallel and planar upper and lower surfaces 44 and 46, respectively. Surfaces 44 and 46 both extend between a pair of opposing parallel and planar front and rear surfaces 48 and 50 and between a pair of opposing parallel and planar side surfaces 52 and 54 (FIG. 3). The precise dimensions of locking member 40 are not critical. It is important, however, that surfaces 44, 46, 52 and 54 be of sufficient elongate extent so as to be able to accommodate a substantial portion of locking engaging device 26 therein. The preferred manner in which device 26 is locked in locking member 40 is described below.

Locking member 40 preferably includes a transverse hole 56 extending through housing 42 between side surfaces 52 and 54, such hole being located adjacent rear surface 50. As best shown in FIG. 3, hole 56 is preferably used to connect the strap of belt 58 thereto, such as by riveting together one end of the belt and a portion of the belt near such end so as to form a loop in the belt at which point a buckle 59 may be positioned.

It must be pointed out that hole 56 in locking member 40, although preferred when said member is to be belted about a ski boot or skier's leg, is not essential to this invention. For instance, and as indicated above, locking member 40 may be affixed directly to a ski boot, such as by mounting housing 42 directly to the boot. Also, as indicated above, locking member 40 may be formed as an integral part of the ski boot.

Referring now more particularly to FIG. 4, housing 42 of locking member 40 includes a circularly cylindrical opening 60 formed through front end 48 in a direction substantially parallel to the longitudinal axis of the housing. The diameter of opening 60 is preferably slightly greater than the diameter of member 26 so that member 26 may be freely slidable in opening 60 in a direction along the axis of said opening, but yet be restrained from movement in directions oblique to said axis. Opening 60 is preferably located in a lower half segment of housing 42, which housing preferably has a depth approximately two and one-half times the diameter of lock engaging member 26 of member 16.

Locking member 40 further includes another opening 62 which extends within housing 42 from upper surface 44 to a location adjacent and above opening 60. Opening 62 further extends from a forward position near front end 48 to a rearward position approximately about two-thirds of the distance from front end 48 to rear end 50 of housing 42. The precise elongate extent of opening 62 in a direction parallel to the longitudinal axis of member 40 is not critical and the desired relationship between the length of opening 62 and that of opening 60 will become apparent below. Housing 42 further includes a passage 64 communicating between opening 60 and 62. Passage 64 is preferably located at the rearward extent of opening 62. The precise purpose of opening 64 will be explained below.

Before continuing with a description of locking member 40, lock engaging device 26 of resilient member 16 shall be described in detail. As stated above, it is the purpose of member 40 to lock upper end 24 of resilient member 16 so that when member 40 is coupled to a skier, an unintentional release of a ski from the skier is prevented. With this in mind, lock engaging device 26, mounted to end 24 of member 16, is specifically structured to be locked in and then released from member 40.

Specifically, device 26 is substantially cylindrical conforming in shape to opening 60 of member 40 and being slightly less in diameter so as to permit the relative sliding between device 26 and member 40 within opening 60. Specifically, device 26 includes a head 76 which is preferably hemispherical in shape although other shapes that yield a gradual increase in the diameter of head 76 will also suffice. Device 24 further includes an annular groove 74 adjacent head 76, the purpose of which shall be described below.

As shown in FIGS. 3 and 4, housing 42 further includes a latch 66 mounted in opening 62 by means of a bolt 68 communicating through a pair of corresponding and aligned apertures (not shown) in housing 42 and latch 66. Latch 66 includes a depending pawl 72 extending through passage 64 into opening 60. The elongate extent of pawl 72 is such that, with latch 66 in its normal position (FIG. 4), the lower end of pawl 72 will contact annular groove 74 of lock engaging member 26 when member 26 is inserted in opening 60 with its head 76 abutting the surface 78 of housing 42. This, of course, locks device 24, and thus resilient member 16, within locking member 16. Pawl 72 is further shaped so that its front surface is at an angle to the vertical whereas the rear surface is vertical so that head 76 will cam the pawl 72 upwardly when inserted into hole 60 but the pawl will prevent inadvertent withdrawal of tip 26 due to the interengagement of the substantially vertical rear surface of pawl 72 with the vertical rear surface of groove 74.

Latch 66 further includes an upstanding boss 80 extending above an upper surface 81 of the latch when the latch is in its normal position (FIG. 4). In this position, upper surface 81 is preferably coplanar with upper surface 44 of housing 42, so that the boss is above the housing for ready manual access.

Latch 66 is biased to its normal position by a compression spring 70 which has one end abutting against the bottom of opening 62 and the other end abutting against the upper surface 73 in latch 66. Thus, compression spring 70 biases latch 66 clockwise, as viewed in FIG. 4, into its normal position.

Device 24 may be released from within housing 42 by exerting a downward force on boss 80 to pivot the latch counter-clockwise about bolt 68, thereby compressing spring 70 and lowering inclined portion 67 of the lower surface of latch 66 into abutment with the floor of opening 62. This correspondingly raises pawl 72 out of passage 64 thereby enabling member 26 to be slid out of opening 60 of housing 42.

The following dimensions are presently preferred for resilient member 16. The distance between head 76 of device 24 and lower surface 23 of mounting block 20 is about 13 inches. The length of cable 28 is approximately 12½ inches and the length of opening 38 in device 24 is about three-fourths inch. Further, the length of spring 30 when in its normal straight position (FIG. 2) is preferably approximately 11 inches. Lastly, end 36 of spring 30 preferably extends approximately one-eighth inch into opening 38 (when in its normal straight position) and one-fourth inch into mounting block 20.

A clearance of about five-eights inch between spring end 36 and the inward terminus of opening 38 has been found sufficient to enable a substantial bending of

member **16**, such as into a knot as shown in FIG. **5**. The purpose of knotting member **16** is to reduce its height in aid of tranporting the skis.

With regard to locking member **40**, the distance between end surfaces **48** and **50** is preferably about 1¼ – 1¾ inches wherein the length of opening **60** is approximately 1 inch.

The above dimensions are those which have been found useful in connection with the presently preferred embodiment of this invention. Obviously, the dimensions may vary depending upon such factors as whether the locking member is to be attached to the ski boot or skier's leg. If the latter, the dimensions of resilient member **16** are preferably increased. Other changes to the above stated dimensions are contemplated in this invention, such specific dimensions as given above being for purposes of example and not as limitations.

In operation, and with reference to the presently preferred embodiment of FIGS. **1**, **3** and **4**, a skier straps belt **58** about his boot or his leg with locking member **40** near the back thereof thereby firmly securing the ski boot to the ski. The skier then reaches down only far enough to grasp lock engaging device **26** of resilient member **16** which is normally upstanding. In accordance with the above dimensions, device **24** would be about a foot above the ground. With member **26** in the skier's hand he may then bend resilient member **16** into a position enabling him to plug member **26** into locking member **40**, (see dotted lines in FIG. **1**).

As device **26** is inserted in opening **60**, and with latch **66** in its normal spring biased position with pawl **72** thereof inserted through passage **64** into opening **60**, head **76** of device **26** will contact the slanted forward edge of pawl **72** as the member is inserted. By forcefully continuing the inward progression of device **26** into opening **60**, pawl **72** is caused to ride up the convex surface of head **74** thereby overcoming the bias of spring **70** and causing the latch to pivot counterclockwise about bolt **68**, as viewed in FIG. **4**. As soon as head **76** is brought into contact with surface **78**, however, pawl **72** will slip back through passage **64** and against annular groove **74** of device **26** thereby restraining the outward movement of said device from opening **60**. As stated above, device **26** may be released by pushing down on boss **80** thereby manually overcoming the bias of spring **70** to pivot the pawl counterclockwise about bolt **68**. Device **26** may then be slipped out of hole **60**, unobstructed by pawl **72**, to remove device **26** from locking member **40**. Once device **26** is removed from locking member **40** and the skier lets go of it, the inherent resiliency of member **16** automatically returns to an upright position so that the process may be again repeated at a later time.

With lock engaging device **26** of resilient member **16** locked in locking member **40**, the ski is prevented from "running away" from the skier in the event the ski boot is released from the main ski binding due to a fall. During such release, member **16** is capable of bending in any direction thereby allowing the free relative movement between the released ski and ski boot, such movement being restrained only in a direction tending to separate the ski from the skier a distance greater than the length of member **16**.

The great flexibility of member **16** may also be used to advantage by tying said member in a knot thereby decreasing the height thereof to facilitate transportation of the ski from location to location. An example of the condition of member **16** when tied in such a manner is shown in FIG. **5**. It is to be recalled that sufficient clearance exists between end **36** of spring **30** and the inward terminus of aperture **38** thereby premitting expansion of the spring as member **16** is so knotted. Transportation of the ski may also be aided by bending member **16** into a position substantially parallel to and closely adjacent the ski and then locking the member in said position by a latch mounted on the ski.

Although the present invention has been described with reference to a presently preferred embodiment, the invention is not limited to such embodiment. Rather, the invention is deemed to include obvious modifications and alterations of the preferred embodiment shown and described herein

For example, resilient member **16** need not be mounted to ski **10** at the position shown in FIG. **1**. Alternatively, member **16** may be mounted directly to the main binding at either toe piece **12** or heel piece **14**. Further, resilient member **16** need not be formed by positioning a flexible, flaccid cable through a resilient helically wound spring. Rather, the resilient member may be defined as a single piece. Also, the particular locking arrangement of member **16** is only exemplary. Thus, if a single piece were used as the resilient member, any locking assembly for holding fast an upper end thereof and for selectively releasing same could be used. A locking engaging device, such as device **26**, need not be included in such a system.

Other modifications and alterations of the preferred embodiment may be made without departing from the spirit of this invention as defined by the following claims.

What I claim is:

1. A runaway device for preventing inadvertent complete disengagement of a ski from a skier, said device comprising:

a. an elongated member that is deformable in a plurality of directions from a normal position and is resiliently restorable from said deformed condition to said normal position, said elongated member comprising a flaccid cable having opposing ends defining the opposing ends of said member and a resilient helically wound spring which is wound about said cable, said spring means restoring the cable to a normally substantially straight position from a deformed position;

b. means for operatively securing one end of said elongated member to a ski so that said elongated member is normally upstanding from said ski;

c. a locking member and means for securing said locking member to a skier; and

d. a lock engaging device mounted on the other end of said cable for releasable engagement with said locking member to releasably lock the other end of said elongated member to said locking member.

2. The assembly of claim **1**, wherein said means for securing said locking means to a skier comprises a strap for securing said locking means to a skier or a ski boot.

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