

[54] **SKI SAFETY BINDING**

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abandoned.

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280/11.35 Y, 11.35 D, 11.35 E, 11.35 A,  
280/11.35 H, 11.35 R

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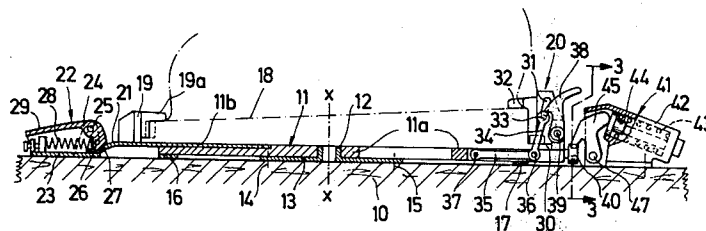
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[57]

**ABSTRACT**

A ski safety binding having a releasable sole plate having a rear part adapted to be lifted, and front and rear sole plate locking devices adapted to hold the sole plate under a locking pressure, said sole plate being mounted on the ski so as to be rotatable about a central vertical axis, toe jaw means mounted on the sole plate, and a heel hold down device on the rear end of said sole plate and releasably held by a locking device and adapted to be released separate from the sole plate locking devices.

**58 Claims, 9 Drawing Figures**



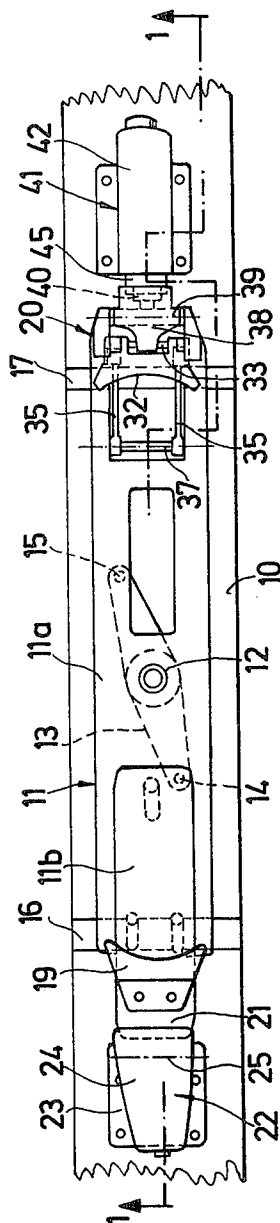
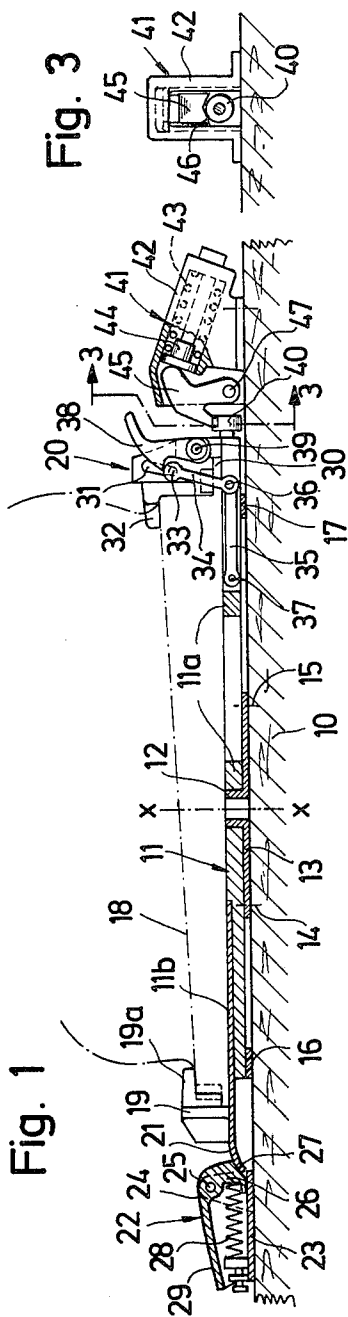
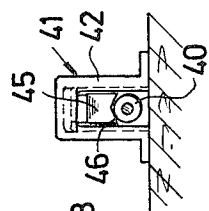


Fig. 3



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Fig. 4

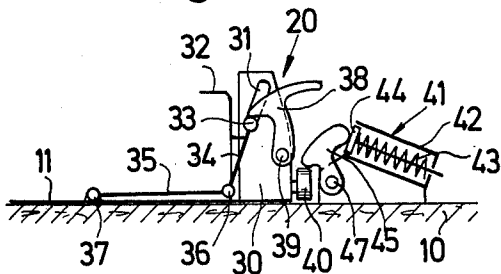


Fig. 5

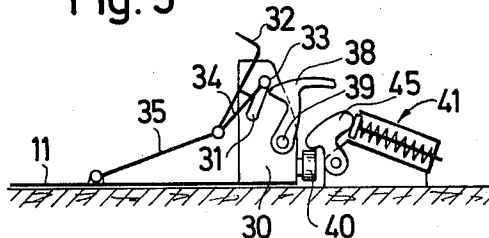


Fig. 6

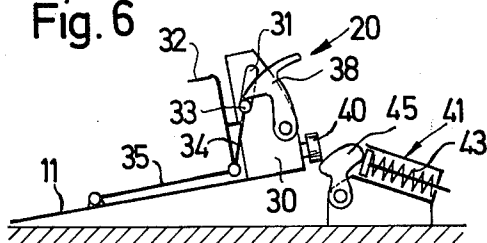


Fig. 8

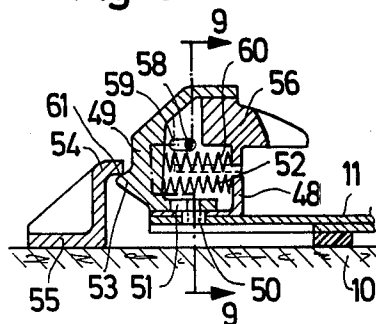


Fig. 9

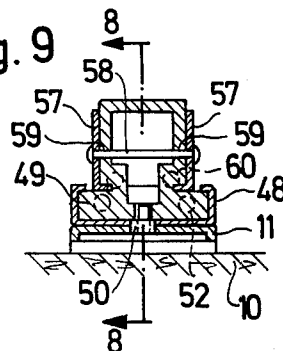
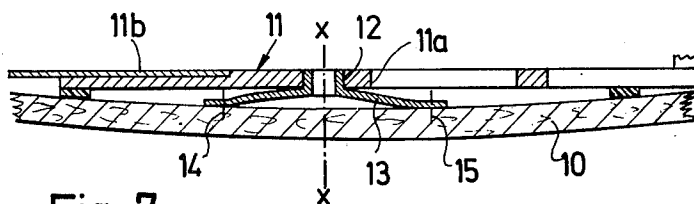


Fig. 7



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## SKI SAFETY BINDING

This is a continuation of my copending application Ser. No. 190,091, filed Oct. 18, 1971 now abandoned.

The present invention relates to a ski safety binding which comprises a sole plate which is movable on the ski, especially by being adapted to turn thereon and/or to be lifted off the ski, and a toe supporting device (sole plate locking device) as well as a heel supporting device (sole plate locking device) at least one of which is operatively associated with the sole plate so as to be releasably locked thereto.

It is an object of the present invention to provide a ski safety binding which under normal skiing conditions insures a firm support of the ski boot on the ski but releases the boot from the ski at any kind of fall of the skier, that is, at a twisting fall as well as at a forward or rearward fall.

For attaining this object, it is an essential feature of the invention to mount the sole plate on the ski so as to be rotatable about a central axis extending vertically to the upper surface of the ski; to secure one or two toe jaws on the front end of the sole plate so as to be rotatable together with this plate; to provide a front locking device on the ski which normally locks the front end of the sole plate to the ski and releases this end if strong forces are exerted thereon in the upward direction, for example, during a fall of the skier toward the rear; and to provide a rear locking device on the ski which normally locks the rear end of the sole plate to the ski and releases this end if strong forces are exerted in the upward direction upon this rear end, for example, during a forward fall of the skier, and also if strong forces are exerted in a transverse direction upon the sole plate, for example, during a twisting fall of the skier.

While during a normal run of the skier, the ski boot, together with the sole plate, will be held in the central position on the ski by the rear locking device which then holds the boot in a locked position in the upward direction as well as in lateral directions, the manner of mounting the sole plate on the ski so as to be rotatable about a central axis extending vertically to the plane of the ski permits the boot, together with the sole plate, to disengage laterally from the front and rear locking devices if the skier suffers a twisting fall. If, on the other hand, the skier suffers a forward fall, the sole plate, together with the boot, will disengage from the rear locking device, while at a rearward fall the boot and sole plate will disengage from the front locking device.

A further object of the invention is to provide such a ski safety binding which is provided with a sole plate, the rear end of which may be lifted off the ski and with a rear heel supporting device (rear sole plate locking device) which holds the sole plate under a releasable locking pressure, and to design this binding so as to permit the boot to be easily removed therefrom intentionally and also to be easily mounted thereon.

For attaining this object, it is another important feature of the invention to provide the ski binding with a heel depressor or heel hold down means which is adapted to be locked to the sole plate independently of the locking pressure which holds the sole plate on the ski, and which is equally adapted to be unlocked from the sole plate when the boot is to be intentionally removed.

Another feature of the invention consists in guiding the heel depressor in a substantially vertical direction on a guide member which is rigidly connected to the

sole plate, so that when the heel depressor is unlocked and moves upwardly from the ski, it will during this upward movement also carry out a pivoting movement toward the rear.

Further objects of the invention are to provide particular constructions of the front and rear supporting means (sole plate locking devices) which are of a simple design and permit the boot and sole plate to disengage from the ski in lateral directions and also at the occurrence of strong upwardly directed forces.

For attaining the last-mentioned objects, it is another feature of the invention to provide a front support (sole plate locking device) of a very compact construction in which a locking member is slidable longitudinally on the sole plate under a spring pressure acting in one direction so that an inclined projection on this locking member will engage with the lower side of another locking member which is rigidly secured to the ski, while a toe jaw forming a sole holder is slidably mounted on the first locking member so as to be movable thereon under a spring pressure which acts in the opposite direction to the first spring pressure.

These and additional objects and features of the invention will become further apparent from the following detailed description thereof which is to be read with reference to the accompanying drawings, in which

FIG. 1 shows a longitudinal section of a ski safety binding according to the invention which is taken along the line 1 — 1 of FIG. 2;

FIG. 2 shows a top view of the ski binding according to FIG. 1;

FIG. 3 shows a cross-section which is taken along the line 3 — 3 of FIG. 1;

FIG. 4 shows a diagrammatic view of the rear heel hold down device according to FIG. 1 with the heel depressor in its operative position;

FIG. 5 shows a similar diagrammatic view of the heel hold down device in the position when the heel depressor is released;

FIG. 6 shows a similar diagrammatic view of the heel hold down device after it has been released by the rear sole plate locking device, for example, due to a forward fall of the skier;

FIG. 7 shows a longitudinal section of a part of FIG. 1 when the ski is in a bent position;

FIG. 8 shows a cross-section of a modification of the front jaw, which is taken along the line 8 — 8 of FIG. 9; while

FIG. 9 shows a cross-section which is taken along the line 9 — 9 of FIG. 8.

In the drawings, FIGS. 1 and 2 show a ski 10 on which a sole plate 11 is rotatably mounted by means of a pivot 12 which is secured to the ski by a plate 13 at two points 14 and 15 which are spaced at a considerable distance from the pivot 12. Sole plate 11 is thus pivotable about the axis  $x - x$  of the pivot 12. Sole plate 11 consists of two parts, namely, a relatively rigid rear part 11a and a relatively flexible front part 11b which is connected to the rear part 11a, for example, by screws or the like so as to permit it to be separated therefrom and to be shifted in its longitudinal direction relative thereto. Since the sole plate 11 should be slidable on the ski with as little friction as possible, strips 16 and 17 of a suitable antifriction material such as Teflon or the like are interposed between the sole plate and the ski.

For holding the boot sole 18 securely on the sole plate 11, the latter is provided near its front end with a toe jaw 19 and on its rear end with a heel hold down device 20. The toe jaw 19 which is preferably provided with a vertically adjustable sole holder 19a for soles of different heights may be rigidly secured to the sole plate 11.

On its front end 21 which projects beyond the toe jaw 19 and is bent or curved slightly downwardly, sole plate 11 is normally held down by a locking device 22 which prevents this front end of the sole plate from moving upwardly. This locking device 22 consists of a base plate 23 on which an angular lever 24 serving as a locking member is pivotably mounted on a pin 25 which extends transverse to the longitudinal direction of the ski. The downwardly bent rear arm 26 of lever 24 is provided with a rearwardly ascending inclined surface 27 and it is pressed toward the rear by a spring 28 so that its inclined surface 27 presses the front end 21 of sole plate 11 against the ski. The forwardly extending arm 29 of lever 24 serves as a stop for limiting the pivoting movement of the lever and also as a handle which when lifted releases the front end 21 of sole plate 11 from the locking device 22.

The rear heel hold down device 20 comprises a bearing bracket 30 which is rigidly secured to the sole plate 11 and serves as a guide member and has an upwardly and rearwardly steeply inclined cam slot 31 in which a guide pin 33 on the heel depressor 32 is slidable. The heel depressor 32 which is preferably adjustable to different heights in accordance with the different thickness of the heels of different boots forms the upper part of an arm 34 the lower end of which is pivotably connected by a hinge 36 to the rear end of a second arm 35. Arm 34 from the upper end of which the heel depressor 32 projects forwardly normally extends substantially vertically to the ski 10, while the other arm 35 normally extends substantially parallel to the ski and its front end is pivotably connected by a hinge 37 to the sole plate 11. As illustrated in FIG. 2, arms 34 and 35 are preferably provided in the form of parallel pairs of such arms.

Bearing bracket 30 further carries a locking lever 38 which is pivotable thereon about a transverse axis 39 and is acted upon by a spring, preferably a torsion coil spring on the hinge 39, so that its forwardly projecting detent engages over the guide pin 33 of the arm 34 and thereby locks the heel depressor 32 in its lowered position relative to the sole plate 11, as shown in FIGS. 1 and 4. If locking lever 38 is pivoted in its clockwise direction about its axis 39, it will release the guide pin 33 and thus also the heel depressor 32.

Bearing bracket 30 further carries a locking member in the form of a roller 40 upon which a locking device 41 is adapted to act which is located behind the heel hold down device 20. This locking device 41 comprises a housing 42 which is rigidly secured to the ski and in which a piston 44 is slidable which is acted upon by a spring 43. Under the pressure of this spring 43, piston 44 acts upon a locking lever 45 which is mounted on the housing 41 so as to be pivotable about a transverse axis 47, and, as shown particularly in FIG. 3, has a pair of surfaces 46 which are inclined at a V-shaped angle to each other and are adapted to engage from above over the roller 40.

FIG. 1 illustrates the ski safety binding as above described in the normal skiing position. Sole plate 11 then

rests flat on the ski 10, the heel hold down device 20 is pressed by the locking device 41 firmly upon the ski by means of the locking lever 45 which presses under spring pressure upon the roller 40, while the front end 21 of the sole plate 11 is likewise pressed downwardly toward the ski by the angular lever 24 of the locking device 22. The inclined surfaces 46 of the rear locking lever 45 also lock the sole plate 11 so as not to turn out of its normal central position about the pivot 12. The boot sole 18 is held in front on the sole plate 11 by the toe jaw 19 which embraces the front end of the sole, while at the rear the boot sole is held on the sole plate by the heel depressor 32 of the heel hold down device which is pressed downwardly by the locking lever 38 which engages over the guide pin 33.

The position of the heel hold down device and the device 41 is illustrated diagrammatically in FIG. 4.

For mounting the ski boot on the ski and its binding or for intentionally removing the boot from this binding, the locking lever 38 is pivoted toward the rear, as shown in FIG. 5. This lever then releases the guide pin 33 which is then moved upwardly within the slot 31 either by hand or by means of a weak spring, not shown. This also causes the two arms 34 and 35 together with the heel depressor 32 to be lifted so that these arms will be pivoted to a more straight position relative to each other and the heel depressor 32 will be pivoted toward the rear to the position as shown in FIG. 5 in which it is released from the heel of the boot. This operation does, however, not affect the position of the sole plate 11 since the latter remains locked by the rear locking device 41.

In the event of a forward fall of the skier, the excessive forces then acting upon the heel in the upward direction will cause the foot to be released from the locking device 41, since, as illustrated in FIG. 6, the upward pressure which is then exerted by the roller 40 on the bearing bracket 30 upon the locking lever 45 will pivot the latter toward the rear against the action of spring 43, so that roller 40 can disengage from the locking lever 45.

The ski binding according to the invention may be designed so that, if excessive forces occur, the sole plate 11 will slide out of the pivot 12 so that the sole plate 11 together with the ski boot will separate from the ski and the front end of the sole plate will be disengaged from the arm 26 of the angular lever 24. Sole plate 11 may then remain connected to the ski by a holding strap, not shown, to prevent the ski from getting lost.

In the event of a rearward fall of the skier, a strong force will be exerted in the upward direction upon the front end 21 of the sole plate. This front end will then act upon the inclined surface 27 of the arm 26 of lever 24 in such a manner that, due to the wedging effect which then occurs, the arm 26 will be forced forwardly and the angular lever 24 as shown in FIG. 1 will be pivoted in the clockwise direction about its axis 25. At its front end, sole plate 11 will thus be released from the locking device 22 so that also in this case the boot together with the sole plate 11 may separate from the ski.

In the event of a twisting fall in which a torque is exerted upon the sole plate 11 in a direction of rotation about its central axis  $x-x$ , the rear roller 40 presses against one of the inclined surfaces 46 of the locking lever 45 and thereby pivots the latter toward the rear so that the roller may slide laterally out of this locking

lever. The entire sole plate 11 may then turn about the axis  $x - x$  and will thereby also move the heel hold down device 20 and the toe jaw 19 in the same direction of rotation, while the front end 27 of the sole plate slides laterally out of its engagement with the angular lever 24 of the locking device 22.

If, as illustrated in FIG. 7, the ski 10 and the sole plate 11 tend to bend relative to each other, for example, because only the front and rear ends of the ski are supported on the ground, while the central part of the ski is disposed above a hole, plate 13 carrying the pivot 12 will act as a reinforcement between the sole plate and the ski by resisting the bending of the two parts away from each other with a force in accordance with the rigidity and strength of this plate. This has especially the advantage that the pivot 12 will not be pulled out of its bearing bore in sole plate 11.

FIGS. 8 and 9 illustrate a modification of the front hold down means in which the toe jaw and the front locking device are combined into a unit which is mounted on the sole plate 11. The front end of sole plate 11 carries in this case a bracket 48 which is rigidly secured to the sole plate and in which a slide member 49 is guided so as to be slidable for a limited distance which is determined by a stud 50 which is secured to sole plate 11 and projects into a slot 51 in slide member 49. This slide member is pressed forwardly by means of a pair of springs 52 one end of which act upon the bracket 48 and the other end upon slide member 49, so that the rear end of slot 51 abuts against the stud 50 which thus serves as a stop. A nose-shaped locking projection 53 on slide member 49 normally engages with the lower side of a rearwardly projecting part 54 of a locking bracket 55 which is rigidly or adjustably secured to the ski 10.

By making the slide member 49 of a suitable hollow shape, it partly encloses and guides a sole holder 56 so as to be slidable in the longitudinal direction of the ski by means of side walls 57 which are slidable along the slide member 49. A crosspin 58 in the side walls 57 of sole holder 56 passes through slots 59 in slide member 49 and limits the extent of the movement of sole holder 56 relative to slide member 49. A pair of springs 60 extending parallel to springs 52 and having one end acting upon slide member 49 and another end acting upon sole holder 56 press the latter toward the rear so that crosspin 58 abuts against the rear end of slot 59.

If an excessive force occurs which acts in the upward direction upon the front end of sole plate 11, the inclined surface 61 on the projection 53 (in place of which or in addition to which an inclined surface may also be provided on the projection 54) will press the slide member 49 toward the rear, that is, toward the right in FIG. 8, and will thereby tighten the spring or springs 52 additionally. The front end of sole plate 11 may thereby slide out of its engagement with bracket 55. Springs 60 then have the purpose to permit the unlocking movement of slide member 49 to take place so that this movement will not be prevented by the sole holder 56 which engages upon the front end of the sole and can then yield accordingly due to the springs 60.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments but is capable of numerous modifications within the scope of the appended claims.

I claim:

1. A ski safety binding for binding a ski boot to a ski comprising:

a sole plate engageable with and extending the length of the sole of the ski boot,

pivot mounting means for pivotably mounting said sole plate so as to be rotatable about an axis extending perpendicular to an upwardly facing sole plate surface,

releasable sole plate locking means for locking the sole plate to said ski in a fixed rotative position,

hold down means separate from said sole plate locking means, said hold down means being connected to and movable with said sole plate and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot, and wherein said sole plate is freely rotatable about said axis and movable away from said pivot mounting means and said ski when said sole plate locking means is in said unlocked position.

2. A ski safety binding according to claim 1, wherein said sole plate locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot.

3. A ski safety binding according to claim 2, wherein said hold down locking means includes means for intentionally releasing said boot from said sole plate while said sole plate locking means is maintained in the locked position.

4. A ski safety binding according to claim 1, wherein said hold down locking means includes a locking lever pivotally mounted on one of said sole plate and said hold down means and movable between a first position in engagement with a locking member which is movable with said boot engaging means on the other one of said sole plate and hold down means to lock said hold down means in said hold down position and a second position out of engagement with said locking member to permit movement of said hold down means to said released position.

5. A ski safety binding according to claim 4, wherein said hold down means, said sole plate locking means, and said hold down locking means are all located at the rear of said boot when said boot is in an in-use skiing position.

6. A ski safety binding according to claim 5, wherein said locking lever is pivotally mounted on said sole plate and said locking member is mounted on said hold down means.

7. A ski safety binding according to claim 5, wherein a front holding device is provided at the front of the boot which includes a locking bracket mounted on the ski, guide means rigidly connected to said sole plate, a locking member guided by said guide means, and resilient front locking means disposed between said guide means and said locking member and adapted to press

said locking member into locking engagement with said locking bracket.

8. A ski safety binding according to claim 4, wherein said locking lever is pivotably mounted on said sole plate and said locking member is mounted on said hold down means.

9. A ski safety binding according to claim 4, wherein said sole plate is attached to said ski such that the front and rear ends of the sole plate may be lifted off of the ski, wherein a front holding device including first front holding means connected to the sole plate and second front holding means connected to the ski is provided, one of said first and second front holding means including resilient front locking means adapted to hold said first and second front holding means in resilient engagement with one another but to release them from each other in the event of a predetermined strong force acting in one of an upward and transverse direction against the front end of said sole plate.

10. A ski safety binding according to claim 9, wherein at least one of said releasable sole plate locking means and hold down locking means includes resilient means adapted to hold said releasable sole plate locking and hold down locking means in resilient engagement with one another but to release them from each other in the event of a predetermined strong force acting in an upward direction against the rear end of said sole plate.

11. A ski safety binding according to claim 10, wherein said releasable sole plate locking means includes means for releasing the sole plate for rotation about said axis in response to a predetermined transverse force on said sole plate.

12. A ski safety binding according to claim 9, wherein said second front holding means includes the resilient front locking means.

13. A ski safety binding according to claim 12, wherein said first front holding means includes at least one jaw engageable over the boot sole and an extended part of said sole plate extending forwardly of said jaw, wherein said second front holding means includes at least one element projecting over said extended part and having an inclined locking surface and means for mounting said element for pivotal movement about an axis extending transverse to said ski, and wherein said resilient front locking means holds said element in resilient locking engagement with said extended part by way of said inclined locking surface such that, in the event of a predetermined strong force acting in the upward direction on said extended part, said element is pressed backwardly by said inclined surface against the action of said resilient front locking means.

14. A ski safety binding according to claim 9, wherein said first front holding means includes the resilient front locking means.

15. A ski safety binding according to claim 1, wherein said hold down means includes guide means connected to said sole plate and a hold down member guided by said guide means for moving upwardly when released by said second releasable locking means.

16. A ski safety binding according to claim 1, wherein said releasable sole plate locking means includes a housing mounted on said ski, a sole plate locking lever pivotally mounted on said housing, and a sole plate locking spring in said housing for resiliently forcing said sole plate locking lever into engagement with a sole plate locking member attached to said sole plate,

and wherein said sole plate locking lever and sole plate locking member engage each other to lock said sole plate in an operative central position, said sole plate locking lever and sole plate locking member being disengageable from one another in response to predetermined excessive forces acting on said sole plate locking lever to move said sole plate locking lever against said sole plate locking spring.

17. A ski safety binding according to claim 1 wherein said hold down means includes guide means connected to said sole plate and a hold down member guided by said guide means for upward movement when said releasable hold down locking means releases said hold down means from said hold down position.

18. A ski safety binding according to claim 1, wherein said hold down means, said releasable sole plate locking means and said releasable hold down locking means are all disposed adjacent the rear end of said boot when said boot is in an in-use skiing position.

19. A ski safety binding according to claim 1, wherein the pivot mounting means is arranged in the middle of the sole plate between the front and rear ends thereof.

20. A ski safety binding according to claim 1, wherein said hold down means includes a front hold down device on the front end of the sole plate and a rear hold down device on the rear end of the sole plate, and wherein said pivot mounting means is disposed approximately midway between the front and rear hold down devices of the sole plate.

21. A ski safety binding according to claim 1, wherein said hold down means includes a rear hold down device, and wherein said hold down locking means includes a manually operable holding lever for selectively locking and unlocking said rear hold down device, said holding lever extending over the boot heel of a ski boot when in position on said ski binding.

22. A ski safety binding for binding a ski boot to a ski comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot, wherein said hold down locking means includes a locking lever pivotally mounted on one of said sole plate and said hold down means and movable between a first position in engagement with a locking member which is movable with said boot engaging means on the other one of said sole plate and hold down means to lock said hold down means in said hold down position and a second position out of en-

gement with said locking member to permit movement of said hold down means to said released position,

wherein said releasable sole plate locking means includes a housing mounted on said ski, a sole plate locking lever pivotally mounted on said housing, and a sole plate locking spring in said housing for resiliently forcing said sole plate locking lever into engagement with a sole plate locking member attached to said sole plate,

wherein said sole plate locking lever and sole plate locking member engage each other to lock said sole plate in an operative central position, said sole plate locking lever and sole plate locking member being disengageable from one another in response to predetermined excessive forces acting on said sole plate locking lever to move said sole plate locking lever against said sole plate locking spring, and

wherein said sole plate locking member comprises a roller having an axis of rotation extending substantially in the longitudinal direction of the ski, said sole plate locking lever having a part with an inverted V-shaped connecting surface engaging from above with said roller.

23. A ski safety binding for binding a ski boot to a ski comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

means for mounting said sole plate so as to be rotatable about an axis, said releasable sole plate locking means including means for preventing rotation of said sole plate about said axis when in a locked position and permitting said rotation when in an unlocked position,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot,

wherein said hold down locking means includes a locking lever pivotally mounted on one of said sole plate and said hold down means and movable between a first position in engagement with a locking member which is movable with said boot engaging means on the other one of said sole plate and hold down means to lock said hold down means in said hold down position and a second position out of engagement with said locking member to permit movement of said hold down means to said released position,

and wherein said means for mounting said sole plate includes a plate, a pivot rigidly secured and projecting from said plate, and means for securing said plate to the ski at two points disposed substantially

within the longitudinal axis of the ski near the opposite ends of said plate and spaced considerably from said pivot.

24. A ski safety binding comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot,

wherein said hold down locking means includes a locking lever pivotally mounted on one of said sole plate and said hold down means and movable between a first position in engagement with a locking member which is movable with said boot engaging means on the other one of said sole plate and hold down means to lock said hold down means in said hold down position and a second position out of engagement with said locking member to permit movement of said hold down means to said released position,

wherein a front holding device is provided at the front of the boot which includes a locking bracket mounted on the ski, guide means rigidly connected to said sole plate, a locking member guided by said guide means, resilient front locking means disposed between said guide means and said locking member and adapted to press said locking member into engagement with said locking bracket, a front sole holding member, means for guiding said front sole holding member relative to said locking member, limiting means for limiting the movement of said sole front holding member, and further resilient means between said locking member and said sole holding member and acting upon the latter so as to abut against said limiting means.

25. A ski safety binding comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable



from the locked position thereof in response to a predetermined strong force acting on the ski boot, wherein said hold down means includes guide means connected to said sole plate and a hold down member guided by said guide means for upward movement when said releasable hold down locking means releases said hold down means from said hold down position,

and wherein said guide means comprise an arm and means for pivotably connecting a first end of said arm to said sole plate and the other end of said arm to said hold down member, a guide cam rigidly connected to said sole plate, and a guide member rigidly connected to said hold down member and guided by said guide cam, said hold down member thus being guided by said arm and said guide cam.

26. A ski safety binding according to claim 25, in which said arm extends substantially from said first pivoted end toward the rear, said hold down member extends from the other pivoted end of said arm substantially upwardly, and said guide cam extends obliquely upward and toward the rear.

27. A ski safety binding according to claim 25, in which said guide member also forms a locking member which is operatively associated with said locking lever to be locked thereby and unlocked therefrom.

28. A ski safety binding comprising:  
a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski, hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot, wherein said hold down means includes guide means connected to said sole plate and a hold down member engageable by said hold down locking means and guided by said guide means for upward movement when said releasable hold down locking means is disengaged from said hold down member to thereby release said hold down means from said hold down position,

and wherein said guide means are designed so that a pivot means for accommodating rearward pivotal movement of said hold down member is guided for upward movement when said releasable hold down locking means releases said hold down means from said hold down position.

29. A ski safety binding according to claim 28, wherein said releasable sole plate locking means includes a housing mounted on said ski, a sole plate locking lever pivotally mounted on said housing, and a sole plate locking spring in said housing for resiliently forcing said sole plate locking lever into engagement with a sole plate locking member attached to said sole plate,

and wherein said sole plate locking lever and sole plate locking member engage each other to lock said sole plate in an operative central position, said sole plate locking lever and sole plate locking member being disengageable from one another in response to predetermined excessive forces acting on said sole plate locking lever to move said sole plate locking lever against said sole plate locking spring.

30. A ski safety binding according to claim 29, further comprising means for mounting said sole plate so as to be rotatable about an axis, wherein said releasable sole plate locking means prevents rotation of said sole plate about said axis when in a locked position and permits said rotation when in unlocked position.

31. A ski safety binding according to claim 28, further comprising means for mounting said sole plate so as to be rotatable about an axis, wherein said releasable sole plate locking means prevents rotation of said sole plate about said axis when in a locked position and permits said rotation when in an unlocked position.

32. A ski safety binding according to claim 31, wherein said hold down means, said releasable sole plate locking means and said releasable hold down locking means are all disposed adjacent the rear end of said boot when said boot is in an in-use skiing position.

33. A ski safety binding according to claim 32, wherein said sole plate is attached to said ski such that the front and rear ends of the sole plate may be lifted off of the ski, wherein a front holding device is provided which includes first front holding means connected to the sole plate and second front holding means connected to the ski, one of said first and second front holding means including resilient front locking means adapted to hold said first and second front holding means in resilient engagement with one another but to release them from each other in the event of a predetermined strong force acting in one of an upward and transverse direction against the front end of said sole plate.

34. A ski safety binding according to claim 33, wherein at least one of said releasable sole plate locking means and releasable hold down locking means includes resilient means adapted to hold releasable sole plate locking means and releasable hold down locking means in resilient engagement with one another but to release them from each other in the event of a predetermined strong force acting in an upward direction against the rear end of said sole plate.

35. A ski safety binding according to claim 34, wherein said releasable sole plate locking means includes means for releasing the sole plate for rotation about said axis in response to a predetermined transverse force on said sole plate.

36. A ski safety binding according to claim 33, wherein said second front holding means includes the resilient front locking means.

37. A ski safety binding according to claim 36, wherein said first front holding means includes at least one jaw engageable over the boot sole and an extended part of said sole plate extending forwardly of said jaw, wherein said second front holding means includes at least one element projecting over said extended part and having an inclined locking surface and means for mounting said element for pivotal movement about an axis extending transverse to said ski, and wherein said resilient front locking means holds said element in resilient locking engagement with said extended part by

way of said inclined locking surface such that, in the event of a predetermined strong force acting in the upward direction on said extended part, said element is pressed backwardly by said inclined surface against the action of said resilient front locking means.

38. A ski safety binding according to claim 33, wherein said first front holding means includes the resilient front locking means.

39. A ski safety binding comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot, wherein said hold down means includes guide means connected to said sole plate and a hold down member guided by said guide means for upward movement when said releasable hold down locking means releases said hold down means from said hold down position,

wherein said hold down means includes a bearing bracket rigidly connected to said sole plate, wherein said guide means is positioned between said sole plate and said bearing bracket for said guiding of said hold down member in an upward direction relative to said sole plate, wherein said releasable hold down locking means includes a locking lever pivotally mounted on said bearing bracket, and wherein said releasable sole plate locking means includes a locking member on said bearing bracket operatively associated with a part of said first releasable locking means attached to said ski.

40. A ski safety binding according to claim 28, in which said locking member consists of a locking roller mounted on the rear side of said bearing bracket and having a rotational axis extending substantially in the longitudinal direction of the ski.

41. A ski safety binding comprising:

a sole plate engageable with the sole of the ski boot, said sole plate being movable between an in-use skiing position and at least one released position, releasable sole plate locking means for locking the sole plate in said skiing position on a ski,

hold down means separate from said sole plate locking means and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position,

wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot, wherein said hold down means includes guide means connected to said sole plate and a hold down member guided by said guide means for upward movement when said releasable hold down locking means releases said hold down means from said hold down position,

wherein said releasable sole plate locking means includes a housing mounted on said ski, a sole plate locking lever pivotally mounted on said housing, and a sole plate locking spring in said housing for resiliently forcing said sole plate locking lever into engagement with a sole plate locking member attached to said sole plate, and wherein said sole plate locking lever and sole plate locking member engage each other to lock said sole plate in an operative central position, said sole plate locking lever and sole plate locking member being disengageable from one another in response to predetermined excessive forces acting on said sole plate locking lever to move said sole plate locking lever against said sole plate locking spring,

and wherein said sole plate locking member comprises a roller having an axis of rotation extending substantially in the longitudinal direction of the ski, said sole plate locking lever having a part with an inverted V-shaped connecting surface engaging from above with said roller.

42. A ski safety binding for a ski boot comprising a sole plate, means for movably mounting said sole plate so as to permit the front end of said sole plate to be lifted off the ski, a locking bracket mounted on the ski, a guide member secured to the front end of said sole plate, a locking member guided by said guide member and movable in the longitudinal direction of the ski, a sole holding member movable in said longitudinal direction relative to and guided by said locking member, and resilient means between said guide member and said locking member and acting upon the latter so as to hold it in a locking position in engagement with said locking bracket, stop means for limiting the movement of said sole holding member relative to said locking member, and further resilient means between said locking member and said sole holding member and adapted to hold said sole holding member in a position determined by said stop means.

43. A ski safety binding according to claim 42, in combination with guide means for slidably moving said locking member in said guide member, and guide means for slidably moving said sole holding member in said guide member.

44. A ski safety binding according to claim 42, in which said locking member and said sole holding member form a housing unit the parts of which are adapted to telescope within and relative to each other similar to the elements of a cylinder and piston unit, said two resilient means being disposed adjacent to each other within said unit.

45. A ski safety binding according to claim 42, in which said locking bracket and said locking member are provided with projections directed toward each

other and engaging over each other, at least one of said projections having an inclined surface upon which the other projection engages in a locking position under the action of said first resilient means so that, if an excessive force acts in the upward direction upon the front end of the sole, the other projection can slide relative to and off said inclined surface while overcoming the action of said first resilient means.

46. A ski safety binding for binding a ski boot to a ski comprising:

a sole plate engageable with and extending the length of the sole of the ski boot,

pivot mounting means for pivotally mounting said sole plate so as to be rotatable about an axis extending perpendicular to an upwardly facing sole plate surface,

hold down means for clamping said ski boot to said sole plate,

and releasable sole plate locking means separate from said hold down means for locking the sole plate to said ski in a fixed rotative position, said sole plate locking means being automatically movable from a locking position to an unlocking position in response to predetermined strong forces acting on the sole plate, said sole plate being freely rotatable about said axis and movable away from said pivot mounting means and said ski when said locking means is in said unlocking position.

47. A ski safety binding according to claim 46, wherein said hold down means include means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole plate and a released position with said sole released from said sole plate.

48. A ski safety binding according to claim 47, wherein said hold down means is connected to and movable with said sole plate.

49. A ski safety binding according to claim 48, wherein said hold down means is arbitrarily releasable from said sole.

50. A ski safety binding according to claim 46, wherein the pivot mounting means is arranged in the middle of the sole plate between the front and rear ends thereof.

51. A ski safety binding according to claim 46, wherein said pivot mounting means includes a plate, a pivot rigidly secured and projecting from said plate, and means for securing said plate to the ski at two points disposed substantially within the longitudinal axis of the ski near the opposite ends of said plate and spaced considerably from said pivot.

52. Sole plate locking means for releasably locking a ski binding sole plate in position on a ski, comprising: housing means mounted on one of said ski and said sole plate,

a locking member mounted on the other of said ski and said sole plate,

a locking lever mounted on said housing,

said locking lever and locking member being engageable with one another to lock said sole plate in an operative central position,

and resilient means in said housing resiliently forcing said lever into engagement with said locking member, said locking lever and locking member being disengageable from one another in response to predetermined excessive forces acting by way of said locking member on said locking lever to move said locking lever against the force of said resilient means,

wherein said locking member comprises a roller having an axis of rotation extending substantially in the longitudinal direction of the ski when said sole plate is in said central position, and wherein said locking lever has a part with a V-shaped connecting surface engaging with said roller when said sole plate is in said operative central position.

53. Sole plate locking means according to claim 52, wherein said housing means is mounted on said ski and said locking lever is pivotally mounted on said housing for pivotal movement about an axis extending transverse to the longitudinal axis of the ski.

54. A hold down device for releasably holding a ski boot on a relatively fixed member; said hold down device comprising:

a boot engaging member engageable with upwardly facing portions of said ski boot, said boot engaging member being movable between a hold down position with said boot clamped against said relatively fixed member and a released position with said boot released from said relatively fixed member, releasable hold down locking means for releasably locking said boot engaging member in said hold down position, said releasable hold down locking means being only arbitrarily releasable,

and guide means for guiding movement of said boot engaging member between said hold down and released positions, said guide means including a pivot means for accommodating pivotal movement of said boot engaging member and means for guiding said pivot means for upward movement during movement of said boot engaging member from said hold down position to said released position.

55. A hold down device according to claim 54, wherein said relatively fixed member is a sole plate which is releasably connectible with a ski.

56. A hold down device according to claim 55, wherein said guide means includes: an arm, means pivotally connecting a first end of said arm to said sole plate and the other end of said arm to said boot engaging member, a guide cam rigidly connected to said sole plate, and a guide member rigidly connected to said boot engaging member and guided by said guide cam.

57. A hold down device according to claim 56, wherein said arm extends substantially from said first pivoted end toward the rear, said boot engaging member extending from the other pivoted end of said arm substantially upwardly, said guide cam extending obliquely upward and toward the rear.

58. A hold down device according to claim 55, wherein said guide member also forms a locking member engageable by said releasable hold down locking means.

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