

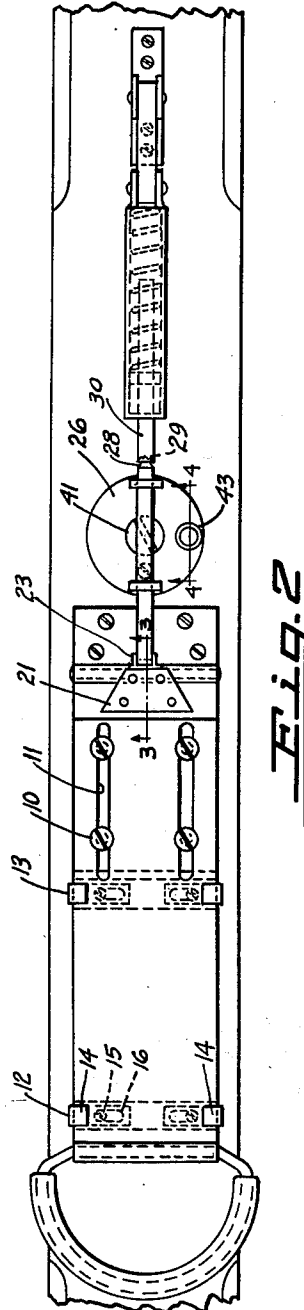
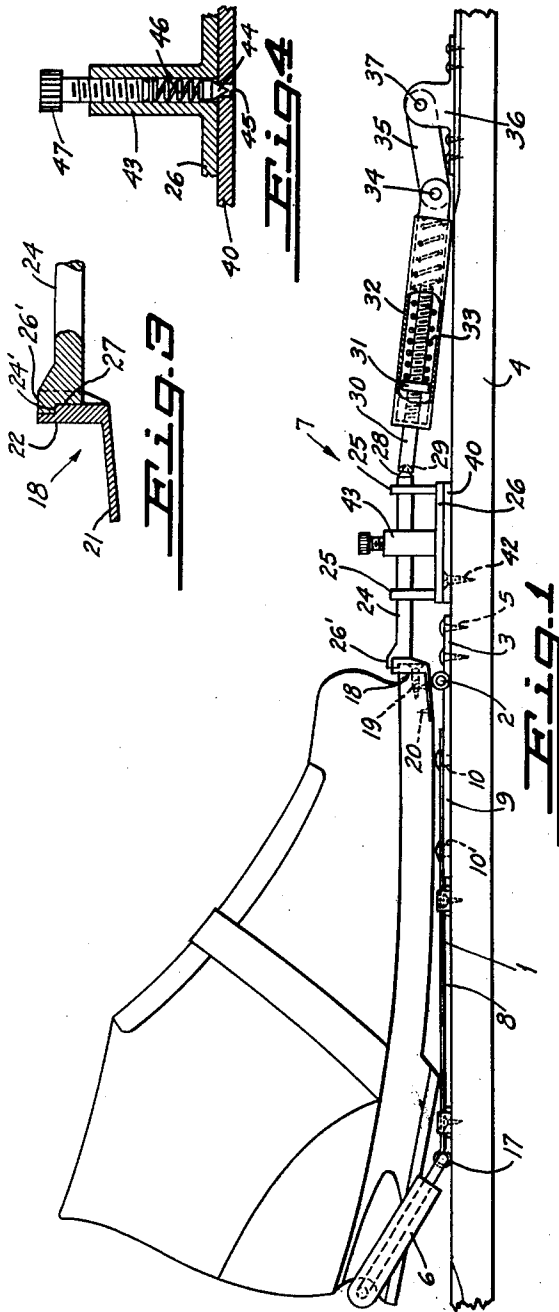
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SAFETY BINDING FOR SKI RUNNERS

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SAFETY BINDING FOR SKI RUNNERS

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The present invention relates to improvements in a safety binding for a ski runner and its principal object is to provide a binding of the character described that will automatically release the boot in case of emergency and at the same time adapts itself for various adjustments of swinging movement of the boot with respect to the ski runner.

For accomplishing these objects it is proposed to hinge the boot rest to the runner at the toe of the boot so as to allow of free swinging movement of the boot with respect to the runner when such free swinging movement is desired.

It is further proposed to provide means for limiting the degree of swinging movement in differing degrees depending upon the particular purpose for which the ski is to be used.

It is further proposed to provide a boot strap at the rear end of the boot rest for engagement over the boot heel and to provide means at the toe of the boot for urging the heel upon the boot strap. This means is made in such a manner that it is adjustable to different degrees of tension.

It is further contemplated to arrange the toe-engaging means in such a manner that it will automatically release the boot in case of a rearward thrust against the front end of the ski such as might be occasioned by the ski striking a fixed object, the degree of force necessary to cause release being adjustable.

It is further proposed to arrange the toe-engaging means in such a manner that it automatically releases the boot in case of a severe side thrust such as would be occasioned by a skier losing his balance and falling into the snow, the amount of force necessary to cause release being independently adjustable.

And finally, it is proposed to provide a binding of the character described that may be easily adjusted to different sizes of boots.

Further objects and advantages of my invention will appear as the specification proceeds, and the novel features of my invention will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing, in which

Figure 1 shows a side view of my safety binding as applied to a ski runner, with the boot in position, certain portions being shown in section,

Figure 2, a plan view of the same arrangement, with the boot omitted,

Figure 3, an enlarged detail section taken along line 3—3 of Figure 2, and

Figure 4, an enlarged detail section taken along line 4—4 of Figure 2.

While I have shown only the preferred form of my invention, I wish to have it understood that various changes and modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawing in detail, my binding comprises in its principal features a boot rest 1 having its front end pivoted, as at 2, to a plate 3 fixed upon the runner 4 by means of screws 5, a boot strap 6 engageable over the heel of the boot, and means generally indicated at 7 bearing against the toe of the boot for urging the heel upon the strap.

The boot rest 1 may be made of any suitable material, preferably of sheet material of a thickness allowing of a certain amount of flexibility, and is preferably construct-

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ed in two sections 8 and 9 connected by screws 10, one of the sections being slotted as at 11 to allow the overall length of the rest to be adjusted for different sizes of boots.

As long as the hinge 2 is relied on as the sole fastening means for the boot rest, the latter is free to swing on the hinge through a large angle. In case it is desired to limit the swinging movement and to anchor the boot more firmly to the runner I provide two clamping means 12 and 13 disposed at selected points along the length of the boot rest, one being preferably placed near the rear end and the other one intermediate the length of the boot rest. Each clamping means comprises two hooks 14 arranged opposite one another and slidable laterally on screws 15 anchored in the runner, by means of slots 16 which allow the hooks to be moved into engagement with edge portions of the boot rest. If the clamping means 13 only is applied, the boot will still have a considerable amount of freedom of swinging movement. If the clamping means 12 is additionally applied, the heel movement is very limited.

The boot strap 6 is hinged to the rear end of the boot rest as at 17. For urging the heel into the boot strap I provide the means bearing on the toe generally illustrated at 7. A bracket 18 is secured upon the front end of the sole of the boot by means of screws 19 and 20, the bracket comprising a flange 21 secured upon the bottom of the sole and a vertical plate 22 secured upon the front edge of the sole, the latter plate having two forwardly projecting spaced flanges 23, with a ledge 24' between the flanges.

A plunger 24 is mounted for cooperation with the bracket in pressing the latter downward and rearward. This plunger is slidable in two posts 25 rising from a disc 26, and is also rotatable in the posts. The rear end of the plunger terminates in a tongue 26' adapted to bear on the ledge 24' between the flanges 23, and with a flat face 27 adapted to bear against the front face of the bracket 18 for urging the latter rearwardly.

The front end of the plunger is tapered as at 28 for engagement in a tapered socket 29 provided at the rear end of a threaded rod 30 which is screwed into a nut 31 slidable in a cylinder 32 and urged rearwardly therein by means of a spring 33, the nut being held against rotary motion by any suitable means, not shown. The front end of the cylinder is pivoted, as at 34, to a link 35 which latter again is pivoted to a fixed bracket 36 as at 37.

The cylinder 32 and the link 35 form a toggle joint exerting rearward pressure on the rod 30 when the pivot 34 is forced downwardly across dead center into contact with the upper face of the runner as shown in Figure 1.

Thus, pressure is exerted on the plunger 24 through the rod 30 and the toggle joint, the degree of pressure depending upon the adjustment of the rod 30 in the nut 31. Pressure on the toe may be manually released by lifting the pivot 34 across dead center, in a well-known manner.

In case the front end of the runner strikes an obstacle such as a tree or a rock which brings it to a sudden stop, the forward momentum of the boot will cause the plunger 24 to plunge forward over the opposition of the spring 33 and cause the heel strap to release itself automatically from the heel of the boot, thus allowing the boot to free itself.

The disc 26 is revolvable upon a second disc 40, both of the discs being held to the runner 4 by means of a center screw 41. The lower disc 40 is held against rotary movement by means of a second screw 42.

The upper disc 26 is normally held against rotation and in such a position as to bring the plunger 24 into alignment with the bracket 18 and the cylinder 32 lengthwise of the runner. However, this means for holding the upper disc against rotation is made in such a manner as to yield to a severe side thrust or twist on the boot, such as would be caused by a bad fall, the amount of torque necessary to cause the disc to rotate being independently adjustable. It comprises a tube 43 rising from the disc off-centrally and having a tapered pin 44 slidable therein, the pointed end of the pin extending into a registering hole 45 in the lower disc. The pointed end of the pin is

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urged into hole by means of a spring 46, the tension of which may be adjusted by means of a screw 47 threaded into the tube 43. In case of a sudden side thrust the pointed end of the pin is thrown out of the hole and allows the upper disc to rotate, breaking the connection at 28—29 and causing the rear end of the plunger 24 to free itself from the bracket so as to release the boot. Where it is desired to have the disc yield under rather light forces, the tension on pin 44 is lessened by means of screw 47. Likewise, where it is desired to have the disc yield under only strong forces, the tension is increased by turning in screw 47.

In applying the boot to the runner, the operator first forces the pivot 34 upward across dead center so as to allow the plunger 24 to freely slide in the posts 25, the rod 30 being disconnected from the plunger at 28. He then places his boot upon the boot rest, with the boot strap 6 placed about the heel as shown in Figure 1, and crowds the front end of the sole downward so as to allow the rear end of the plunger to engage in the bracket 18. Next he engages the socket end of the rod 30 over the pointed front end of the plunger 24 and forces the pivot 34 downward across dead center into the position shown in Figure 1 which completes the operation. In case the runner, in skiing, strikes a fixed object and comes to a sudden stop, the boot causes the plunger 24 to go forward and thus automatically releases the heel strap from the heel of the boot. In case of a sudden side thrust on the front end of the boot, the pin 44 is crowded out of the hole 45 and allows the upper disc 26 to turn with the result that the connection between the front end of the plunger and the rear end of the rod 30 is broken and the rear end of the plunger disengages itself from the bracket 18 for releasing the front end of the boot.

It will be noted that the toe fastening means indicated generally at 7 does not in any way interfere with the free swinging movement of the boot about the pivot 2. However, the free swinging movement may be limited by application of either one of the clamps 12 and 13, depending upon the degree of swinging movement desired. For downhill racing or jumping the skier will apply both clamps so that there is very little play and the heel is securely held to the ski runner. For general touring a moderate degree of swinging movement of the heel is desirable, and for this exercise the skier will disengage the back clamp 12, relying on the clamp 13 to limit the swinging movement. For cross country touring on substantially flat terrain it is desirable to have the heel unattached and to allow the boot to freely swing on the pivot 2, and for such touring as well as for so-called telemark turns the skier will release both of the clamping means 12 and 13. It will be noted that these various adjustments of the swinging movement are made possible particularly by the fact that the pressure for crowding the heel against the heel strap is applied to the toe of the boot and does not in any way interfere with the free swinging movement of the latter.

It will also be noted that the amount of torque necessary to cause disc 26 to yield to rotation and thus release the boot from the ski runner is adjusted by the amount of force applied to the tapered pin 44 by spring 46 through screw 47, and is not governed by the amount of force applied longitudinally on the boot or the position of the boot rest with respect to the runner.

It will be noted that the amount of rearward force applied to the ski runner to cause the release of the boot is adjustable by turning threaded rod 30 in nut 31 and is not affected by the adjustment of screw 47, nor does it affect the adjustment of the latter.

I claim:

1. A safety binding for a ski runner comprising a boot rest having its front end hinged to the runner, a boot strap secured upon the rest and engageable over the boot heel, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a spring-pressed plunger operable to yield in response to a back thrust on the forward end of the runner for releasing the heel from the strap, and a normally fixed, revoluble mounting for the plunger operable to turn in response to an abnormally severe side thrust on the boot for releasing the front end thereof.

2. A safety binding for a ski runner comprising, a boot rest having its front end hinged to the runner, a boot strap secured upon the rest and engageable over the

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boot heel, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a bracket secured upon the front end of the boot and having a ledge thereon, with flanges on opposite sides of the ledge, and a plunger slidably mounted on the runner forwardly of the boot and having a tongue engageable over the ledge for holding the front end of the boot, the plunger having spring means urging the same toward the boot.

3. A safety binding for a ski runner comprising, a boot rest having its front end hinged to the runner, a boot strap secured upon the rest and engageable over the boot heel, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a bracket secured upon the front end of the boot and having a ledge thereon, with flanges on opposite sides of the ledge, a plunger mounted on the runner forwardly of the boot with freedom of endwise sliding movement and a sidewise swinging movement and having a tongue engageable over the ledge, yielding means urging the plunger toward the boot, and yielding means holding the plunger against sidewise swinging movement.

4. A safety binding for a ski runner comprising a boot rest having its front end hinged to the runner, a boot strap secured upon the rest and engageable over the boot heel, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a bracket secured upon the front end of the boot and having a ledge thereon, with flanges on opposite sides of the ledge, a plunger mounted on the runner forwardly of the boot with freedom of endwise sliding movement and a sidewise swinging movement and having a tongue engageable over the ledge, yielding means urging the plunger toward the boot, and yielding means holding the plunger against sidewise swinging movement, the former means including a toggle linkage for urging the plunger upon the boot and a releasable connection between said linkage and the plunger, and the latter means including means of adjustment to yield to any desired sidewise force and independent of the amount of force exerted in a longitudinal direction.

5. A safety binding for a ski runner comprising a boot rest having its front end hinged to the runner, a boot strap secured upon the rear end of the rest and engageable over the boot heel, cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, and releasable means spaced along the length of the boot rest for securing selected portions of the rest upon the runner, the said means comprising opposing pairs of hook members slidable transversely on the runner and engageable over the side edges of the rest.

6. A safety binding for a ski runner comprising a toe anchoring means secured to the runner and having a means for yielding to sideways forces which can be adjusted to yield to any desired amount of force independent of the amount of force exerted in a longitudinal direction, and having means for yielding to endways forces, the latter including a spring-pressed plunger operable to urge the boot against a cooperative means of holding the heel of the boot to the runner and to yield in response to a back thrust on the forward end of the runner for releasing the heel of the boot.

7. A safety binding for a ski runner having a boot strap engageable over the heel of a boot, comprising a spring-pressed plunger engageable over the toe of the boot and operable to yield in response to a longitudinal thrust on the forward end of the runner for releasing the heel from the strap, and a normally fixed, revoluble mounting for the plunger operable to turn in response to an abnormally severe side thrust on the boot for releasing the front end thereof.

8. A safety binding for a ski runner having a boot strap engageable over the heel of a boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the said means, comprising a member engageable over the toe of the boot for anchoring the same, a toggle joint operable for urging the member upon the toe, and a normally fixed, revoluble mounting for the member operable to turn in response to an abnormally severe side thrust on the boot for releasing the front end thereof.

9. A safety binding for a ski runner, comprising a boot strap secured with respect to the runner and engageable over the rear of a boot, and cooperative means on the

front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a bracket secured upon the front end of the boot and having a ledge thereon, with flanges on opposite sides of the ledge, a plunger mounted on the runner forwardly of the boot with freedom of endwise sliding motion and a sidewise swinging movement and having a tongue engageable over the ledge, means urging the plunger toward the boot, and yielding means associated with the plunger holding the plunger against sidewise swinging movement.

10. A safety binding for a ski runner, comprising a boot strap secured with respect to the runner and engageable over the rear of the boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a member mounted on the runner forwardly of the boot with freedom of sidewise swinging movement and having a means engageable over the toe of the boot for anchoring the toe, and yielding means carried by said member for normally holding the member against sidewise swinging movement with the anchoring means in active position the yielding means being operable by a severe side thrust on the boot to release the toe-anchoring means by a sidewise swinging movement of the said member.

11. A safety binding for a ski runner, comprising a boot strap secured with respect to the runner and engageable over the rear of the boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a member mounted on the runner forwardly of the boot with freedom of sidewise swinging movement and having a means engageable over the toe of the boot for anchoring the toe, and yielding means carried by said member for normally holding the member against sidewise swinging movement with the anchoring means in active position, the yielding means being operable by a severe side thrust on the boot to release the toe-anchoring means by a sidewise swinging movement of the said member, and having means for adjusting its resistance to such sidewise movement.

12. A safety binding for a ski runner having a boot strap engageable over the heel of a boot, comprising a spring-pressed plunger engageable over the toe of the boot and operable to yield in response to a longitudinal thrust on the forward end of the runner for releasing the heel from the strap, and a normally fixed, revolvable mounting for the plunger operable to turn in response to an abnormally severe side thrust on the boot for releasing the front end thereof, the said plunger having means for adjusting its spring pressure, and the mounting having means for adjusting its resistance to a turning movement operable independently of the spring pressure adjustment.

13. A safety binding for a ski runner, comprising a boot strap secured with respect to the runner and engageable over the rear of the boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the strap, the latter means including a member mounted on the runner forwardly of the boot with freedom of sidewise swinging movement and having a means engageable over the toe of the boot for anchoring the toe, and yielding means carried by said member for normally holding the member against sidewise swinging movement with the anchoring means in active position, the yielding means comprising an eccentrically disposed, fixed seat, a spring-loaded element slidable in said member and engaging in said seat and means for adjusting the spring load on the plug.

14. Releasable means for holding the toe of a boot upon a ski runner comprising a bracket having means for securing the same upon the front of the sole of the boot, toe-anchoring means having means for revolvably mounting the same on the runner forwardly of the bracket, cooperative tongue and groove means on the bracket and the toe-anchoring means for holding the bracket against sidewise movement as long as the toe-anchoring means occupies a predetermined position, an releasable means carried by the toe-anchoring means for holding the toe-anchoring means against turning movement operable to yield in case of a severe side thrust on the bracket to

allow the anchoring means to turn and the bracket to free itself from the anchoring means.

15. Releasable means for holding the toe of a boot upon a ski runner comprising a bracket having means for securing the same upon the front of the sole of the boot, toe-anchoring means having means for revolvably mounting the same on the runner forwardly of the bracket, cooperative tongue and groove means on the bracket and the toe-anchoring means for holding the bracket against sidewise movement as long as the toe-anchoring means occupies a predetermined position, and releasable means carried by the toe-anchoring means for holding the toe-anchoring means against turning movement operable to yield in case of a severe side thrust on the bracket to allow the anchoring means to turn and the bracket to free itself from the anchoring means, the bracket and the toe-anchoring means having also cooperative tongue and ledge means for exerting downward pressure upon the bracket.

16. A toe hold for a boot mounted upon a ski runner, comprising a member having means for mounting the same upon the runner forwardly of the boot with freedom of turning movement, toe-anchoring means mounted on said member and engaged with the front extremity of the boot, and means normally holding the member against turning movement but adapted to yield to severe side stresses for releasing the toe-anchoring means and for freeing the forward end of the boot to slide off the runner sidewise, the said means comprising a fixed seat and a spring-loaded element slidable in said member and engaging in said seat.

17. A toe hold for a boot mounted upon a ski runner, comprising a member having means for mounting the same upon the runner forwardly of the boot with freedom of turning movement, toe-anchoring means mounted on said member and engaged with the front extremity of the boot, and means normally holding the member against turning movement but adapted to yield to severe side stresses for releasing the toe-anchoring means and for freeing the forward end of the boot to slide off the runner sidewise, the said means comprising a fixed seat and a spring-loaded element slidable in said member and engaging in said seat, and means for adjusting the spring load on said element to a desired degree of side pressure.

18. A safety binding for a ski runner having a boot heel holding member engageable over the heel of a boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the heel holding member, the said means comprising a member engageable with the toe of the boot for anchoring the same, a toggle joint operable for urging the member upon the toe, and a normally fixed, revolvable mounting for the member operable to turn in response to an abnormally severe side thrust on the boot for releasing the front end thereof.

19. A safety binding for a ski runner, comprising a boot heel holding member secured with respect to the runner and engageable over the rear of the boot, and cooperative means on the front end of the boot and the runner for urging the boot heel upon the heel holding member, the latter means including a member mounted on the runner forwardly of the boot with freedom of sidewise swinging movement and having a means engageable with the toe of the boot for anchoring the toe, and yielding means carried by said member for normally holding the member against sidewise swinging movement with the anchoring means in active position, the yielding means being operable by a severe side thrust on the boot to release the toe-anchoring means by a sidewise swinging movement of the said member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,364,620	Crocker et al. -----	Dec. 12, 1944
2,383,064	Lanz -----	Aug. 21, 1945
2,491,485	Durham -----	Dec. 20, 1949
2,534,038	Lanz -----	Dec. 12, 1950

FOREIGN PATENTS

327,523	Italy -----	July 13, 1935
596,836	Great Britain -----	Jan. 12, 1948
603,512	Great Britain -----	June 17, 1948