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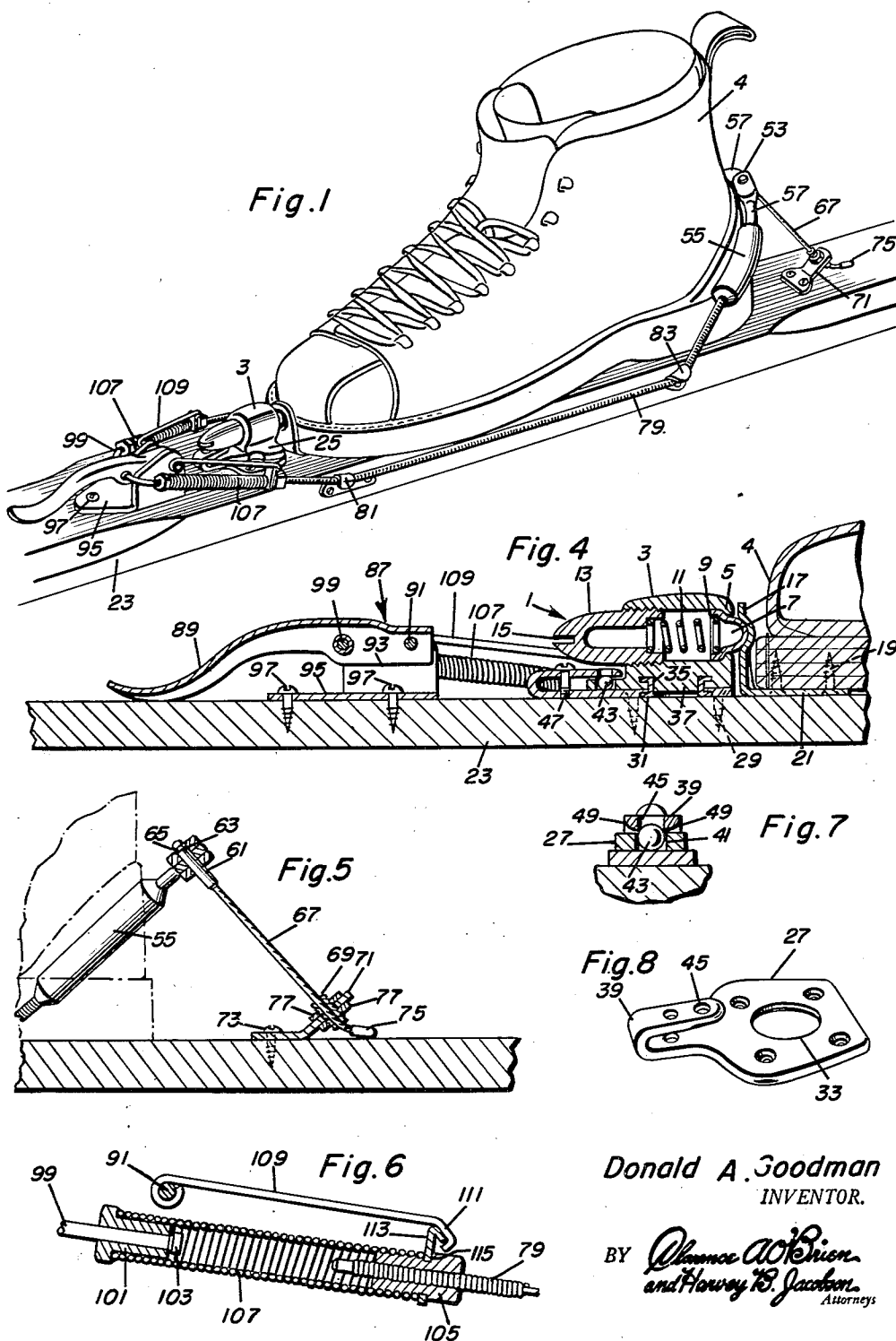
D. A. GOODMAN

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BALL SKI BINDING WITH OSCILLATABLE BOOT TOE FASTENING AND RELEASE

Filed Oct. 26, 1953

2 Sheets-Sheet 1



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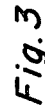
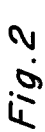
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BALL SKI BINDING WITH OSCILLATABLE BOOT TOE FASTENING AND RELEASE

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2 Sheets-Sheet 2



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2,777,705

BALL SKI BINDING WITH OSCILLATABLE BOOT TOE FASTENING AND RELEASE

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5 Claims. (Cl. 280—11.35)

My invention relates to ball ski bindings and is designed as an improvement over the ball ski binding of my copending application Serial No. 197,731, filed November 27, 1950, now Patent No. 2,667,359, dated January 26, 1954.

The primary object of my invention is to provide a quick releasable ski binding for fastening a ski boot on a ski and which embodies improved releasable boot toe fastening means mounted on the ski for oscillation from side to side to facilitate release of the toe of the boot when an abnormal hard twist sidewise is imparted to the boot as in a fall or the like.

Another object is to provide in such a binding improved boot heel fastening means facilitating release of the heel in a forward fall by the skier.

Still another object is to provide in such a binding improved means at the front of the ski for tightening the binding quickly and easily.

Still another object is to provide for accomplishing the above by means of comparatively simple inexpensive construction.

Other and subordinate objects together with the precise nature of my improvements will become readily apparent when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in perspective of my improved ball ski binding applied to a ski and ski boot;

Figure 2 is a view in side elevation of the same;

Figure 3 is a view in top plan;

Figure 4 is an enlarged fragmentary view in longitudinal section taken on the line 4—4 of Figure 3;

Figure 5 is an enlarged fragmentary view in longitudinal section taken on the line 5—5 of Figure 3;

Figure 6 is an enlarged fragmentary view in longitudinal section taken on the line 6—6 of Figure 3;

Figure 7 is an enlarged fragmentary view in vertical transverse section of the detent of the boot toe fastening means; and

Figure 8 is a view in perspective of the base plate of the boot toe fastening means.

Referring to the drawings by numerals, the boot toe fastening means 1, like in the binding of my copending application, supra, comprises a socket 3 in front of the toe of the boot 4 open at its front and rear ends and having an internal flange 5 in its rear end, a hollow dome shaped plunger 7 projecting out of the rear end of the socket 3 and slidably retractable therein with a rim flange 9 coacting with flange 5 to retain the plunger in the socket 3, a coil spring 11 in the socket backing the plunger and opposing retraction thereof, and an abutment member 13 for said spring 11 threaded into the front end of the socket 3 and having a kerf 15 in its front end for screw driver adjustment of the abutment to variably tension the spring 11. Also as in my copending application supra, the plunger 7 of the described boot toe fastening means yieldingly seats rearwardly in

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an upright concave keeper 17 fixed to the toe of the boot 1 by wood screws 19 and a bottom flange 21 on said keeper.

According to my improvements the above described boot toe fastening means 1 is pivotally mounted on top of the ski 23 for oscillation sidewise about an axis perpendicular to the ski by the following means. A base flange 25 on the socket 3 is fitted flat on a supporting base plate 27 for said socket which is secured on top of the ski 23 by wood screws 29. A steel grommet 31 extends upwardly through a central opening 33 in the base plate 27 and is suitably recessed at one end into the bottom of said plate 27 flush therewith in underlapping relation to the edge of opening 33. The grommet 31 forms a bushing which is suitably inserted into an annular groove 35 in said flange and interlocked with the groove, said groove 35 forming a bearing post 37 in said flange 25 rotatably fitted in the grommet 31.

Detent means is provided for yieldingly latching the boot toe fastening means 1 against oscillation from a normal fastening position. This means comprises a resilient front tongue 39 on the base plate bent upwardly and rearwardly therefrom substantially parallel therewith and overlying a circular recess 41 in the front of the flange 25. A ball 43 fitting in the recess 41 and seating on the base plate 27 is provided for snapping into a relatively smaller circular terminal recess 45 in the tongue 39, to yieldingly interlock therewith. A screw 47 in the tongue 39 and turned into the plate 25 provides for adjusting the tongue 39 downwardly to tension the detent means so that the detent means will release the boot toe fastening means for oscillation when a hard twist is imparted to the boot 4 as in an accident, or to tension said tongue so that the detent means will lock the boot 35 toe retaining means 1 against oscillation. The tongue 39 as best shown in Figure 7 is provided with longitudinally beveled bottom edges 49 for camming engagement with the ball 43 to facilitate snap action interlocking of the detent means in either direction of oscillation of the boot toe fastening means 1 into normal position.

The boot heel fastening means of my invention comprises a boot heel straddling yoke 53 including a pair of tubular resilient heel grips 55 having a pair of arcuate metal links 57 suitably fixed in and extending out of rear ends thereof and one of which has a bifurcated rear end 59 in which one end of the other link is pivoted by a vertical pin 61. The pin 61 has a circumferential groove 63 in its upper end. A collapsible split resilient ring 65 in the groove 63 expands out of the same and locks said pin in the links 57 but is compressible in said groove by downward pull on said pin to form a pull out pivotal connection between the links 57 to detach the same. As will be seen the grips 55 and links 57 form jaw sections of the yoke 53 separable to release the same from heel gripping position.

A pull cord 67 is suitably attached to the lower end of the pin 61 and to the ski 23 at the rear of the boot 4, by means presently described so that if the heel of the boot 4 is lifted in a forward fall, or the like, of the skier, said pin 61 will be pulled. The pull cord 67 is attached to the ski 23 to incline downwardly and rearwardly, when the yoke 53 is attached by means of a sleeve 69 threaded through an angle bracket 71 screwed as at 73 on the ski 23, said cord having a terminal ferrule 75 thereon preventing it from pulling out of the sleeve 69. Lock nuts 77 on the sleeve 69 provide for locking the same to the bracket 75.

A pair of flexibly armored cables 79 are suitably fastened at rear ends thereof within the grips 55 to the front ends of the links 57 and extend forwardly under front and rear pairs of inverted longitudinally arcuate cable guides 81, 83 secured by screws 85 to opposite

sides of the ski 23 adjacent the toe and heel of the boot 4. The cables incline downwardly to the rear guides 83 to pull the yoke 53 downwardly and forwardly against the boot heel and are secured at the front ends thereof to cable tightening means 87 described in the following.

The cable tightening means comprises a throw lever 89 pivoted at one end by a transverse rod 91 in a pair of vertical ears 93 of a bracket 95 fastened on top of the ski 23 in front of the boot toe fastening means 1, by screws 97, said lever being vertically swingable forwardly and downwardly against the ski 23 into cable tightening position. The lever 89 is disposed in the longitudinal center of the ski 23. A U-shaped shackle rod 99 is pivotally secured transversely in the lever 89 in straddling relation for forward and downward throw with said lever. The ends of the shackle rod 99 extend rearwardly from opposite sides of the lever 89. A pair of tubular plugs 101 sleeved on the ends of said rod 99 are retained thereon by terminal heads 103 on said ends. The front ends of the cables are screwed into a pair of tubular plugs 105. The pairs of plugs 101, 105 are threaded into opposite ends of a pair of cable tensioning helical contractile springs 107.

Latch means for preventing expansion of the spring 107 is provided. This means comprises a pair of latch bars 109 pivoted at corresponding ends on the rod 91 at opposite sides of the lever 89 for swinging downwardly and rearwardly to engage hooks 111 on the other ends thereof with upstanding aperture keeper members 113 fixed on the plugs 105 between the rear ends of the springs 107 and shoulders 115 on said plugs 105.

Referring now to the operation of the ski binding. The cables 79 are tightened by swinging the throw lever 89 downwardly into cable tightening position shown in the drawings. Such swinging of the throw lever 89 swings the shackle rod downwardly and forwardly to exert pull on the springs 107 and cables 79 so that the yoke 53 of the heel fastening means is clamped to the heel of the boot 4 so as to hold said heel down and the toe of the boot 4 fastened down by the boot toe fastening means 1. The pull of the springs 107 and cables 79 against the shackle rod 99 is such that said lever, rod and springs 107 form a past dead center lock for said lever. If the skier desires yield in the cables 79 the latch bars 109 are disengaged from the keepers 113. If not the springs 107 are latched against expansion by the described spring latch means. If the skier pitches forwardly in a fall the upward lift by the heel of the boot 4 will cause the pin 61 to be pulled out by the cord 67 to disconnect the links 55 and release the yoke to free the heel of the boot 4. Under a hard sidewise twist of the boot in either direction, as in a fall or other accident, the boot toe fastening means may oscillate sidewise to facilitate release of the boot toe. Under a backward fall by the skier the plunger 7 will yield in opposition to the spring 11 to release the boot toe in a manner which will be clear. A slight degree of oscillation of the boot toe fastening means 1 may occur without freeing the boot toe and to facilitate normal skiing.

The foregoing will it is believed suffice to impart a clear understanding of my invention without further explanation.

Manifestly the invention is susceptible of modification without departing from the inventive concept and right is reserved for such modifications as fall within the scope of the invention as herein disclosed.

What is claimed as new is as follows:

1. In a ski binding, means for fastening a boot to a ski comprising boot toe fastening means engageable with a toe socket on a boot, means pivotally mounting said toe fastening means on said ski for oscillation about an axis perpendicular to said ski into socket disengaging position, and a yielding detent means for yieldingly latching said boot toe fastening means against oscillation, said means pivotally mounting said boot toe fastening

means comprising a plate fixed to said ski, said detent means comprising a vertically spaced resilient apertured tongue on said plate, an apertured flange on said boot toe fastening means and a ball in the aperture in said flange adapted to snap into the aperture in said tongue.

2. In a ski binding for securing on a ski a ski boot having a toe socket therein, boot toe fastening means for engaging said socket, means pivotally mounting said boot toe fastening means on said ski for oscillation into socket-releasing position about an axis perpendicular to the ski, boot heel straddling means adapted to be tightened forwardly against said heel to fasten said heel and maintain said socket and boot toe fastening means engaged, a hand lever pivoted on said ski forwardly of said boot toe fastening means for vertical swinging downwardly and forwardly against the ski, tightening means for said heel straddling means operative by such swinging of said lever, and a yielding detent means for yieldingly latching said boot toe fastening means against oscillation, said means pivotally mounting said boot toe fastening means including a plate fixed to said ski, said detent means comprising a vertically spaced resilient apertured tongue on said plate, an apertured flange on said boot toe fastening means, and a ball in the aperture in said flange adapted to snap into the aperture in said tongue.

3. In a ski binding for securing on a ski a ski boot having a toe socket thereon, boot toe fastening means for engaging said socket, means pivotally mounting said boot toe fastening means on said ski for oscillation into socket releasing position about an axis perpendicular to the ski, boot heel straddling means adapted to be tightened forwardly against said heel to fasten said heel and maintain said socket and boot toe fastening means engaged, a hand lever pivoted on said ski forwardly of said boot toe fastening means for vertical swinging, downwardly and forwardly against the ski, tightening means for said heel straddling means operative by such swinging of said lever, and a yielding detent means for yieldingly latching said boot toe fastening means against oscillation, said means pivotally mounting said boot toe fastening means including a plate fixed to said ski, said detent means comprising a vertically spaced resilient apertured tongue on said plate, an apertured flange on said boot toe fastening means, and a ball in the aperture of said flange adapted to snap into the aperture in said tongue, said tongue having cam edges for engaging said ball when said boot toe fastening means is oscillated in opposite directions.

4. In a ski binding for securing on a ski a ski boot having a toe socket therein, boot toe fastening means for engaging said socket, means pivotally mounting said toe fastening means on said ski for oscillation into socket releasing position about an axis perpendicular to the ski, boot heel straddling means adapted to be tightened forwardly against said heel to fasten said heel and maintain said socket and boot toe fastening means engaged, a hand lever pivoted on said ski forwardly of said toe fastening means for vertical swinging downwardly and forwardly against the ski, and tightening means for said heel straddling means operative by such swinging of said lever, said heel straddling means comprising a pair of arcuate heel gripping links, one having a rear apertured and bifurcated end, and the other having a rear apertured end fitted in said bifurcated end, a vertical pin extending through said apertures and pivotally and separably connecting said links together, said pin being slidable downwardly out of said apertures to disconnect said links to release said heel, a pull cord attached at one end to the lower end of said pin and having its other end attached to said ski to pull the pin out of said apertures in response to upward movement of said links by upward movement of said heel relative to the ski, and a resilient expandable ring on the upper end of said pin above said rear ends yieldingly preventing downward sliding of the pin, said ring being collapsible

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for pulling through said apertures by said pin when said pin is slid downwardly out of said apertures.

5. In a ski binding, means for fastening a boot to a ski including boot heel straddling means comprising a pair of arcuate heel gripping links one having a rear apertured and bifurcated end and the other having a rear apertured end fitted in said bifurcated end, a vertical pin extending through said apertures and pivotally and separably connecting said links together, said pin being slidable downwardly out of said apertures to disconnect said links and release said heel, a pull cord attached at one end to the lower end of said pin and having its other end attached to said ski to pull the pin out of said apertures in response to upward movement of said links by upward movement of said heel relatively to the ski, and a resilient expansible ring on the upper end of said pin above said rear ends, yieldingly preventing downward sliding of the pin, said ring being collapsible for pulling through said apertures by said pin when said pin is slid downwardly out of said apertures.

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