Oct. 10, 1961 A. C. HILDING 3,003,777

SKI BINDING

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FIG. 1

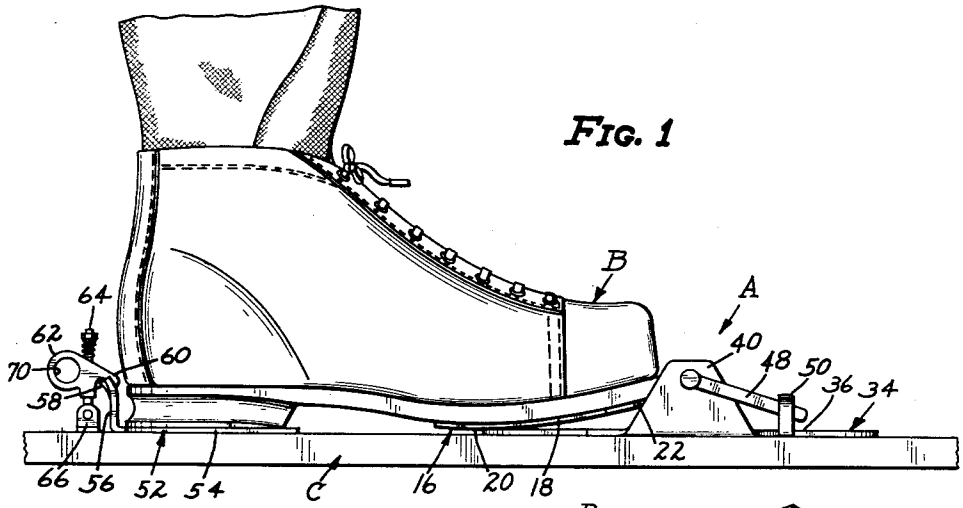



FIG. 2

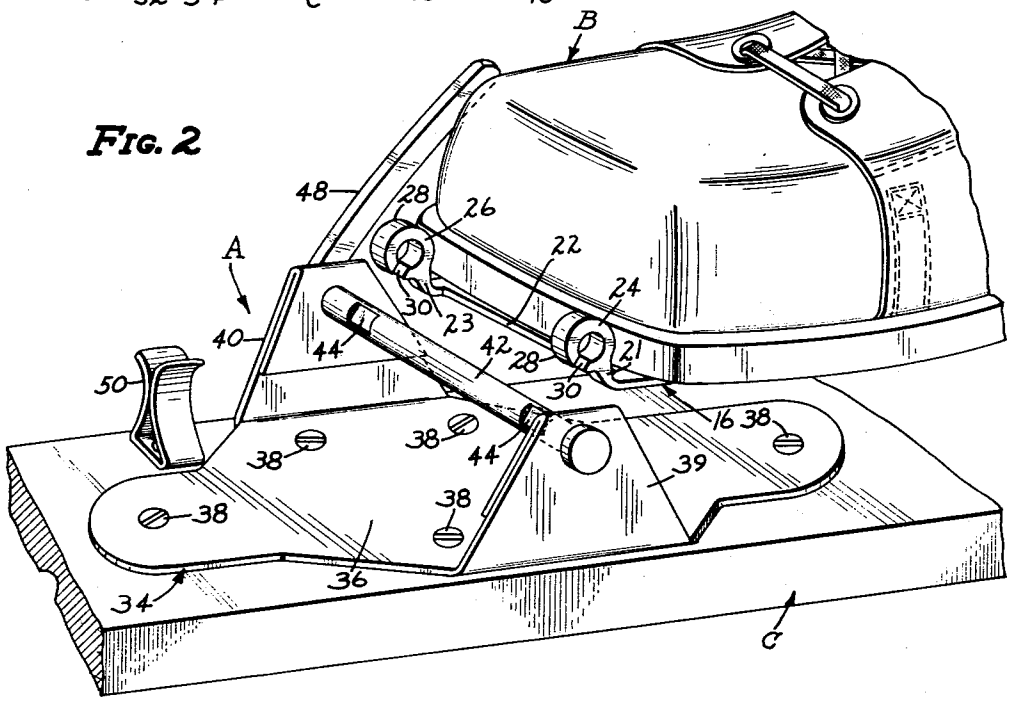



FIG. 3

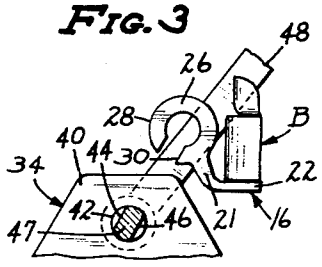
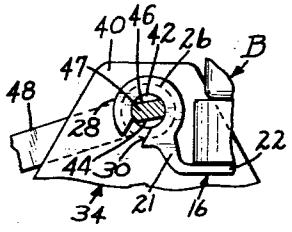



FIG. 4




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SKI BINDING

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FIG. 5

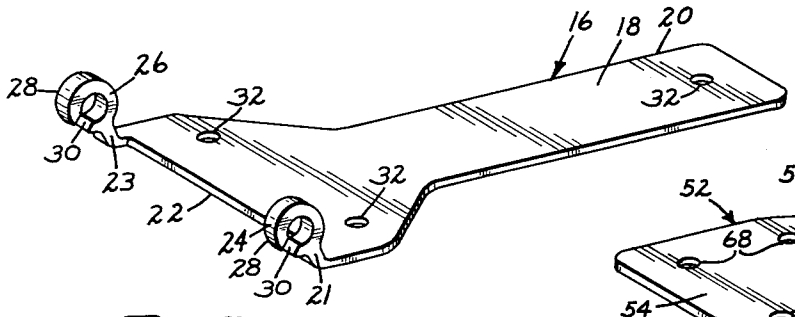



FIG. 6

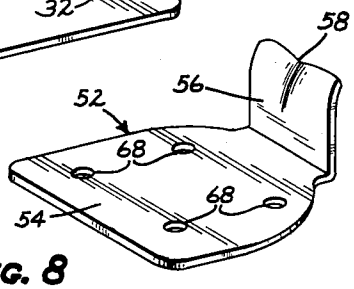



FIG. 7

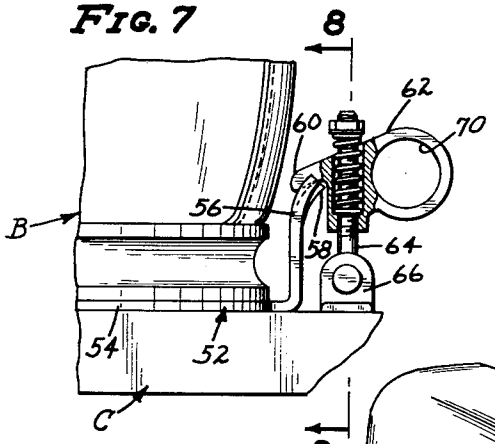



FIG. 8

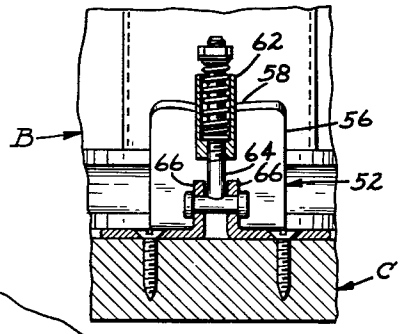
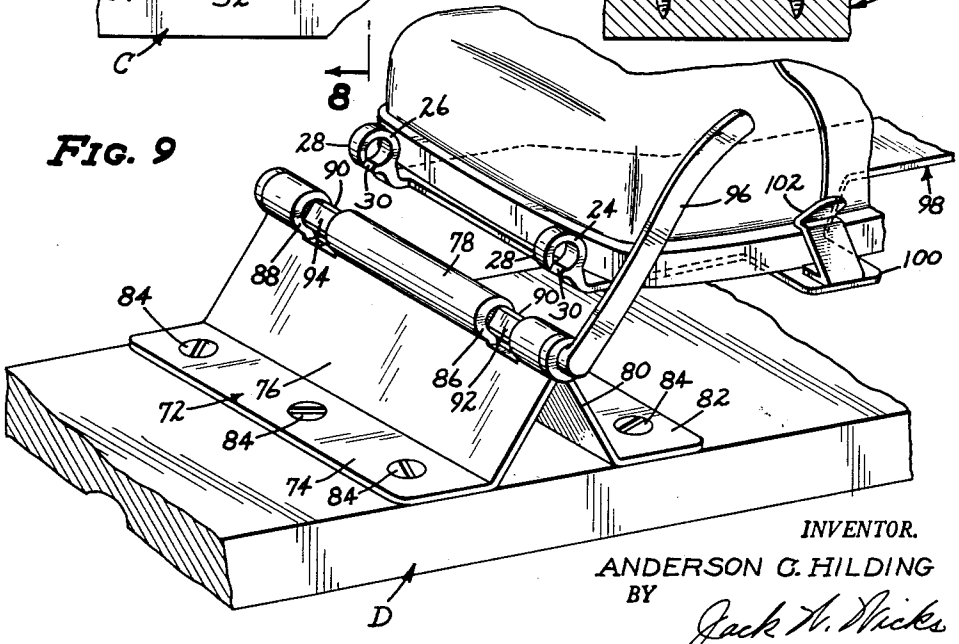



FIG. 9




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SKI BINDING

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FIG. 10

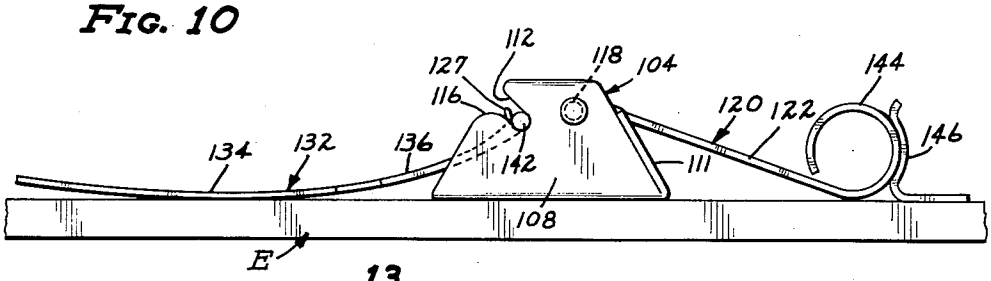



FIG. 11

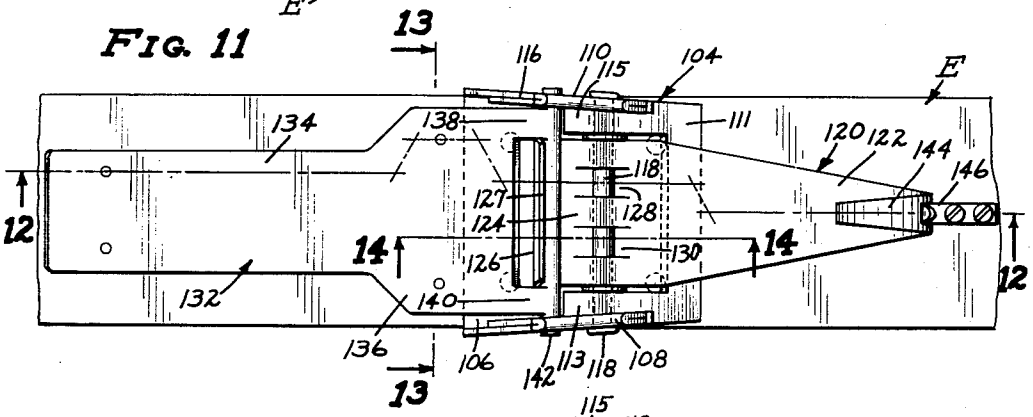



FIG. 12

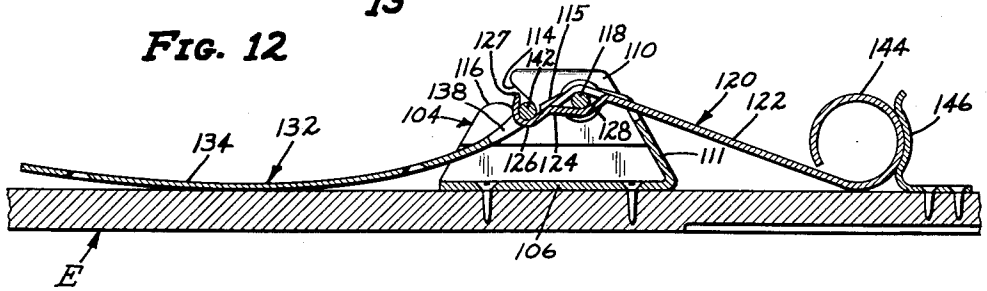



FIG. 13

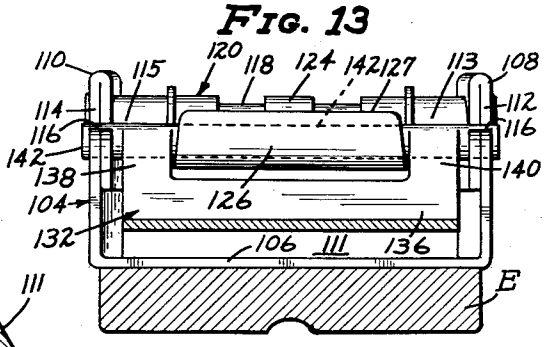
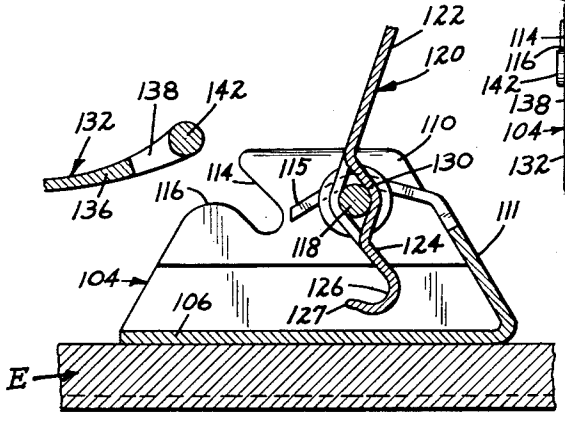



FIG. 14




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# 3,003,777
# SKI BINDING

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Filed Apr. 25, 1960, Ser. No. 24,487
11 Claims. (Cl. 280—11.35)

My invention relates generally to skiing equipment and, more particularly, to a binding, a portion of which is mounted on the ski with a complementary portion mounted on the boot which removably secures the ski boot to the ski. More specifically, my invention relates to an improvement in a binding having a construction which is particularly adaptable to cross-country skiing, and which is an improvement on the disclosure in my Patent No. 2,649,306.

Conventional ski bindings which may be used for cross-country skiing do not allow proper movement of the foot and ankle relative to the ski and the same are difficult to connect to and disconnect from the ski.

It is, therefore, an object of my invention to provide a ski binding which allows the desired movement of the foot relative to the ski in a, more or less, natural walking movement. It is a further object to provide a ski binding which allows easy and positive connection of the boot with the ski and easy release of the boot from the ski. With my invention, the connecting and disconnecting of the boot and ski may be done simply by the skier without bending over, by a simple manipulation of a portion of the binding by means of a ski pole. While my binding is particularly adapted for cross-country use, it may be used for slope skiing, as well.

It is also an object to provide a ski binding which substantially prevents snow from accumulating under the toe of the boot.

I shall not here attempt to set forth and indicate all of the various objects and advantages incident to my invention, but other objects and advantages will be referred to in or else will become apparent from that which follows.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of examples preferred embodiments of the inventive idea wherein like numerals refer to like parts throughout.

In the drawings forming part of this application:

FIGURE 1 is a side elevational view of my ski binding attached to a ski with a boot illustrated in position in the binding.

FIGURE 2 is a perspective view showing the base plate mounted on the ski with the boot in raised position for placing the boot plate in easy engagement with the base plate.

FIGURE 3 is a detailed side elevational fragmentary view of the front portion of the boot plate in position for engagement with the transverse rod of the base plate, the rod being shown in section.

FIGURE 4 is a view similar to FIGURE 3 with the boot plate in engagement with the base plate.

FIGURE 5 is a perspective view of the boot plate.

FIGURE 6 is a perspective view of the heel plate.

FIGURE 7 is a side elevational view of the heel plate and heel connector member.

FIGURE 8 is a view on the line 8—8 of FIGURE 7.

FIGURE 9 is a perspective view of a further embodiment of my binding showing the base plate mounted on a ski with the boot in raised position for placing the boot plate in engagement with the base plate.

FIGURE 10 is a side elevational view of a further embodiment of ski binding shown as secured to a ski in engaged position.

FIGURE 11 is a top plan view of the binding illustrated in FIGURE 10.



FIGURE 12 is a longitudinal sectional view on the line 12—12 of FIGURE 11.

FIGURE 13 is a sectional view on the line 13—13 of FIGURE 11.

FIGURE 14 is a section through the base plate and the forward engaging portion of the boot plate in disengaged position.

Referring to the drawings in detail, my binding A includes the boot plate **16** which is formed of the flat body portion **18** having the relatively narrow rear portion **20** which terminates in the widened front portion **22**. Extending outwardly and upwardly from the front portion **22** by means of the extension portions **21** and **23** are the spaced connector lugs **24** and **26**. The connector lugs **24** and **26** are identical, each being formed of a substantially semi-circular collar portion **28** defining a slot or opening **30** formed therein having substantially parallel surfaces. The openings **30** are disposed to the body portions **18** at an angle of approximately 45°. The inner surface of the collar forms a bearing for the shaft hereinafter mentioned. The boot plate **16** is connected to the sole of the boot B by means of screws positioned in the holes **32** with the connector lugs **24** and **26** at the front edge of the sole of the boot, FIGURES 2, 3 and 4.

Further provided is the ski plate member **34** including the flat base portion **36** secured to the upper face of the ski C by the screws **38**. Formed integral with and extending upwardly from the base **36** are the spaced flanges **39** and **40**. The flanges **39** and **40** rotatably support the shaft **42** at the ends thereof. The shaft **42** has formed thereon the parallel, spaced and flat areas **44** and **46** adjacent one end of the shaft and the identical areas formed adjacent the opposite end of the shaft. The areas **44** and **46** form a flattened area **47** on the shaft **42**.

The numeral **48** designates a lever which is secured to an outer end of the shaft **42** and which is used to rotate and secure the shaft as hereinafter explained. The thickness of the shaft material between the surfaces **44** and **46** form a flattened area **47** on the shaft **42**.

width of the opening **30**.

Further provided is the spring clip **50** secured to the ski C in line with the lever **48** and adapted to receive the lever **48** and hold the same in a lowered position, such as illustrated in FIGURES 1 and 4, to maintain said flattened areas **47** out of register with said slots **30**.

The boot B is connected to the ski plate **34** by holding the boot substantially in the raised position shown in FIGURES 2 and 3 with the spaced flattened portions **47** of the shaft **42** in line with the openings **30** of the connector lugs **24** and **26**. The boot is then moved forwardly and downwardly so that the lugs **24** and **26** engage the pair of spaced flattened portions **47** and further moved so that the shaft **42** is within the lugs. The lever **48** is then moved forwardly to the position of FIGURES 1 and 4, thereby moving the flattened portions **47** out of alignment with the openings **30**. The lever **48** is held in the forward position by engaging the same with the clip **50** secured to the ski C.

In the event it is desired to firmly secure the boot to the ski for slope skiing, I provide, in addition, the heel plate **52** formed of the flat base portion **54** and the upstanding rear flange portion **56**. The flange portion **56** has formed therein the depression **58** which receives the hook end **60** of the spring urged clamp **62** mounted on the shaft **64** pivotally connected at its lower end to the lugs **66** secured to the ski. The heel plate **52** is secured by screws inserted through the holes **68**. The clamp **62** has the ring portion **70** which may be easily engaged by a ski pole for releasing the hook **60** or placing the hook **60** on the flange **56**.

In FIGURE 9 is illustrated a further embodiment of the invention wherein is found the ski plate **72** which in-

cludes the base plate flange portion 74, and extending upwardly and angularly therefrom is the support portion 76 terminating in the tubular bearing formation 78. Extending downwardly and angularly from the tubular bearing formation 78 is the support portion 80 which terminates in the flange portion 82. The plate 72 is secured at its flanges 74 and 82 to the ski D by means of the screws 84.

The tubular bearing formation 78 is formed with the spaced openings 86 and 88. Further provided is the shaft 90 which is substantially identical to the shaft 42 of FIGURES 1–4. The shaft 90 is rotatably mounted in the tubular bearing portion 78 and has formed thereon the spaced flattened areas 92 and 94 formed in the manner of the flattened areas 47 hereinbefore mentioned. The spacing and positioning of the flattened areas is such that the same align with the openings 86 and 88. The numeral 96 designates a lever which is secured to an outer end of the shaft 90 and which is used to rotate and secure the shaft 90 as hereinafter explained.

Further provided is the boot plate 98 which is identical to the plate 16, but, in addition, has the flange 100 extending from the side edge thereof which has mounted thereon the clip 102. The binding shown in FIGURE 9 is operated by holding the boot in the slightly raised position as shown and with the openings 30 of the connector lugs 24 and 26 in alignment with the flattened areas 92 and 94 of the shaft 90. The toe of the boot is then moved forwardly and downwardly so that the flattened areas 92 and 94 enter the openings 30 of the connector lugs 24 and 26 and the lugs rest upon the shaft 90. The lever 96 is then moved rearwardly and engaged by the clip 102 adjacent the sole of the ski boot. Such movement of the lever moves the openings 30 of the connector lugs out of alignment with the flattened areas 92 and 94 whereby the lugs are connected to the ski plate member 72 for limited pivotal connection therewith. To remove the boot, the lever 96 is lifted from engagement with the clip 102 to an angle whereby the openings 30 are in alignment with the flattened areas 92 and 94. As a result the lugs 24 and 26 may be removed from the shaft 90.

With the boot in connected position with the ski plate 72 it will be seen that the portion 76 thereof prevents snow from lodging under the extreme front portion of the boot where the same is quite undesirable particularly when the boot is attached having once been used in the ski. An accumulation of snow and ice on the ski at the point of the toe of the boot prevents easy connection of the boot plate with the ski plate 72.

In FIGURES 10–14 I have illustrated a further embodiment of the invention wherein is shown a portion of a ski E on which is mounted the ski plate 104. The ski plate 104 includes the flat base portion 106 and extending upwardly therefrom at the opposed longitudinal edges are the upstanding spaced flanges 108 and 110. The flanges 108 and 110 are formed with the slots 112 and 114, respectively, which are angularly disposed to the ski E. The lower edge of each of the slots 112 and 114 is formed with the rounded entrance shoulder portion 116. Extending upwardly from the forward edge of the base 106 is the inclined front wall portion 111 having the spaced extended portions 113 and 115.

Rotatably connected to the flanges 108 and 110 is the shaft 118. In addition, I provide the throw-catch member 120 which includes the flat body portion 122 and angularly disposed from the body portion 122 is the rear portion 124 which terminates in the lateral hook portion 126. At the angular junction of the body portion 122 and the rear portion 124 are formed the two spaced and depressed portions 128 and 130 stamped from the throw-catch member to form a bearing in the catch member 120 which receives the shaft 118 thereby pivotally mounting the throw-catch member 120 on the ski plate 104.

I further provide the boot plate 132 formed of the main body portion 134 which is secured to the sole of a ski boot. The boot plate 132 has formed on the forward end of the main body portion 134 the broadened head portion 136 including the two spaced ear members 138 and 140 which mount the transverse rod 142.

The forward portion of the throw-catch member 120 is formed with the circular formation 144 which engages the arcuate spring catch member 146 mounted on the top of the ski to releasably thereby hold the throw-catch member 120 in the forward and downward position as shown in FIGURES 10–13.

In using the ski binding of FIGURES 10–14 the boot plate 132 is secured to the bottom of the boot. The user manipulates the boot and places the ends of the rod 142 into the slots 112 and 114 of the flanges 108 and 110 with the clamp member 120 in the opened condition as shown in FIGURE 14. The clamp member is then pivotally lowered into the position of FIGURES 10–13 with the circular ring portion 144 in engagement with the catch 146. As the throw-catch member 120 is lowered from the position of FIGURE 14 to that of FIGURES 10–13 the hook 126 thereof engages the rod 142 of the boot plate 132 shown in detail in FIGURE 12. The hook 126 is so positioned that the outer end 127 thereof is closely adjacent a line extending between the upper edges of the slots 112 and 114 whereby the rod 142 cannot be removed from the slots 112 and 114 and is neatly retained therein.

To release the boot from the ski plate 104, the throw-catch member 120 is lifted from the position of FIGURE 12 to that of FIGURE 14 thereby allowing removal of the rod 142 from the slots 112 and 114 of the flanges 108 and 110, respectively.

It will be seen that the inclined front wall portion 111, the spaced extended portions 113 and 115 together with the throw-catch member 120 substantially prohibit snow from entering under the front of the toe of the boot and that the disconnecting of the boot from the ski plate 104 is easily and simply made by taking a ski pole and raising the throw-cacth 120 by means of the ring 144. With such construction the skier does not have to bend over to connect or disconnect the boot from the ski plate 104. A heel plate such as 52 may be also used in conjunction with the clamp 62.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a ski binding, the combination of a ski plate having a pair of spaced upstanding flanges, a shaft member rotatably mounted on said flanges and having a pair of spaced flattened portions formed thereon, a boot plate adapted to be connected to the sole of a ski boot and having a pair of connector lugs extending from the front thereof, said connector lugs being spaced the same distance as said flattened portions on said shaft and each having a bearing portion with an entrance opening leading thereto, a lever connected to said shaft for rotating the same, said lugs being engaged with said shaft by positioning said flattened areas through said entrance openings of said connector lugs into the bearing portion thereof, said lever being actuated to move said flattened portions of said shaft out of register with said entrance openings of said connector lugs to prevent removal of said connector lugs from said shaft.

2. The device of claim 1, including means for releasably securing said lever in a position to hold said entrance openings of said connector lugs out of register with said flattened portions of said shaft.

3. In a ski binding, a ski plate adapted to be secured to a ski, means for rotatably mounting a shaft on said ski plate, a boot plate adapted to be secured to the sole of a ski boot and having a pair of connector lugs formed thereon and extending forwardly thereof, and cooperating means formed on said lugs and said shaft for position-

ing and releasably securing said connector lugs on said shaft.

4. In a ski binding, a ski plate adapted to be secured to a ski, a shaft rotatably connected to said ski plate, a boot plate adapted to be secured to the sole of a ski boot and having a pair of spaced connector lugs formed thereon, each of said connector lugs having a bore and an opening leading to said bore, said shaft having a pair of spaced flattened areas adapted to be positioned through said openings of said connector lugs and into said bores thereof, and lever means for rotating said shaft to move said flattened areas of said shaft out of register with said openings of said connector lugs to thereby releasably connect said boot plate to said ski plate.

5. In a ski binding, a ski plate having a shaft rotatably mounted thereon, said shaft having two spaced flattened areas, lever means for rotating said shaft to change the position of said flattened areas thereon, a boot plate adapted to be secured to the sole of a ski boot, said boot plate having a pair of spaced connector lugs, each of said lugs having a bearing portion and an opening in said lug leading to said bearing portion whereby said connector lugs may be attached to said shaft by directing said flattened areas of said shaft through said openings of said lugs into said bearing portions of said lugs and rotating said shaft by means of said lever to move said flattened areas out of register with said openings and thereby hingedly and removably lock said boot plate to said ski plate.

6. The device of claim 5 including means for releasably securing said lever means in a position with said flattened areas out of register with said openings of said lugs.

7. In a ski binding, a ski plate having a pair of upstanding flanges and a shaft rotatably mounted thereon, slot means formed in each of said flanges, a throw member pivotally mounted on said shaft and having a hook formed on the rear end thereof, a boot plate adapted to be secured to the sole of a boot, said boot plate having a transverse rod connected thereto adapted to be positioned in said slot means of said ski plate and engageable by



said hook of said throw member for removably locking said rod in said slot means of said ski plate to thereby hingedly and removably connect said boot plate to said ski plate.

8. In a ski binding, a ski plate having spaced upstanding flange means, a shaft mounted on said spaced flange means above said plate in vertical spaced relation, a throw member pivoted centrally on said shaft, said throw having hook means formed on the rear end thereof, said flange means having slot means formed therein, a boot plate having a transverse rod means adapted to be positioned in said slot means of said flange means and engaged by said hook means to removably hold said rod means therein.

9. The device of claim 8 including hook means formed on the front end of said throw member.

10. The device of claim 9 including means for releasably engaging said hook means of said throw member to retain said throw member in a forward position.

11. In a ski binding, a ski plate adapted to be secured to a ski, a shaft rotatably connected to said ski plate, a boot plate adapted to be secured to the sole of a ski boot and having at least one connector lug formed thereon, said connector lug having a bore and an opening leading to said bore, said shaft having a flattened area adapted to be positioned through said opening of said connector lug and into said bore thereof, and lever means for rotating said shaft to move said flattened area of said shaft out of register with said opening of said connector lug to thereby releasably connect said boot plate to said ski plate.


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