United States Patent [19]

Mimeur

[11] **3,773,341**

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[54] **SKI BINDING**

[75] Inventor: **Robert Mimeur,** Sallanches, France

[73] Assignee: **Etablissements Carpano & Pons S.A.,** Cluses, France

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Dec. 7, 1970 France 7043910

[52] **U.S. Cl.** ..... **280/11.35 T**

[51] **Int. Cl.** **A63c 9/00**

[58] **Field of Search** ..... 280/11.35 T

[56] **References Cited**

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3,575,438	4/1971	Unger	280/11.35 T
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Primary Examiner—Robert R. Song

Attorney—Robert E. Burns et al.

[57] **ABSTRACT**

A safety ski binding of the type normally retaining the skier's boot on the ski and releasing the boot in case of a lifting effort exceeding a preset value, comprises a movable stirrup piece adapted to be pulled by means of a belt for voluntarily releasing the boot, said stirrup acting against a compression spring and being pivoted to the case of the device by means of a pair of lateral rivets displaceable along apertures formed in said case, the latter carrying at least one stop member engageable by said stirrup said rivets having the dual function of compressing said spring and releasing the boot retaining member.

3 Claims, 5 Drawing Figures

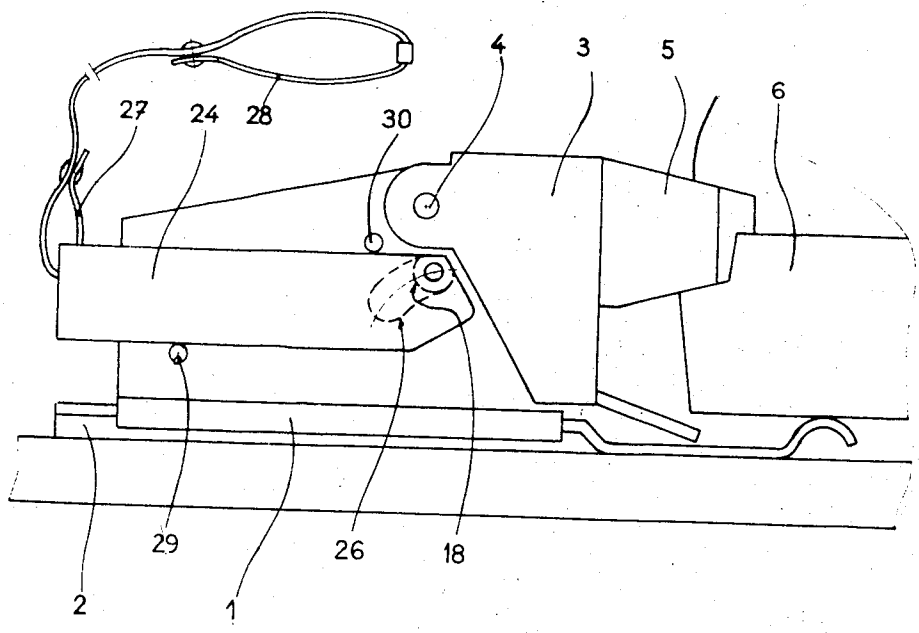

Fig. 1

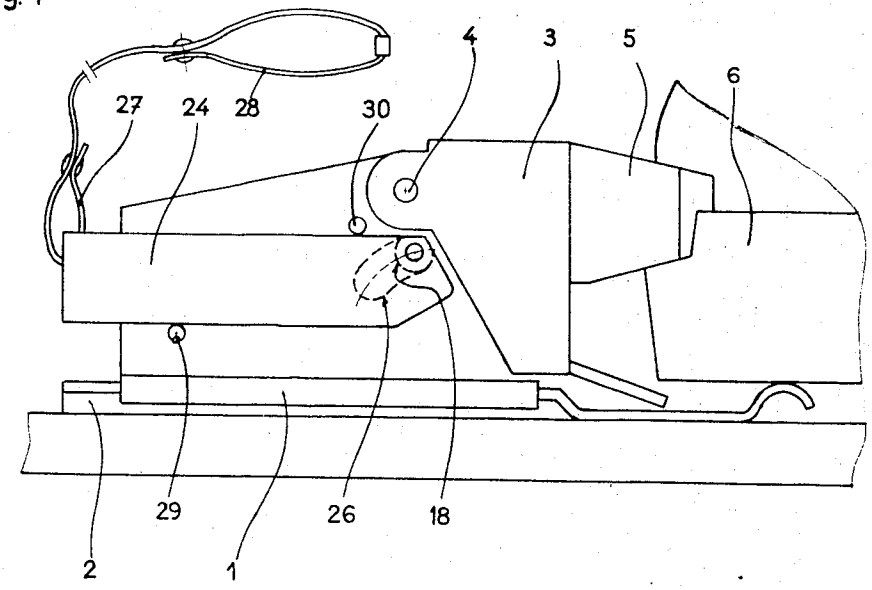
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Fig. 2

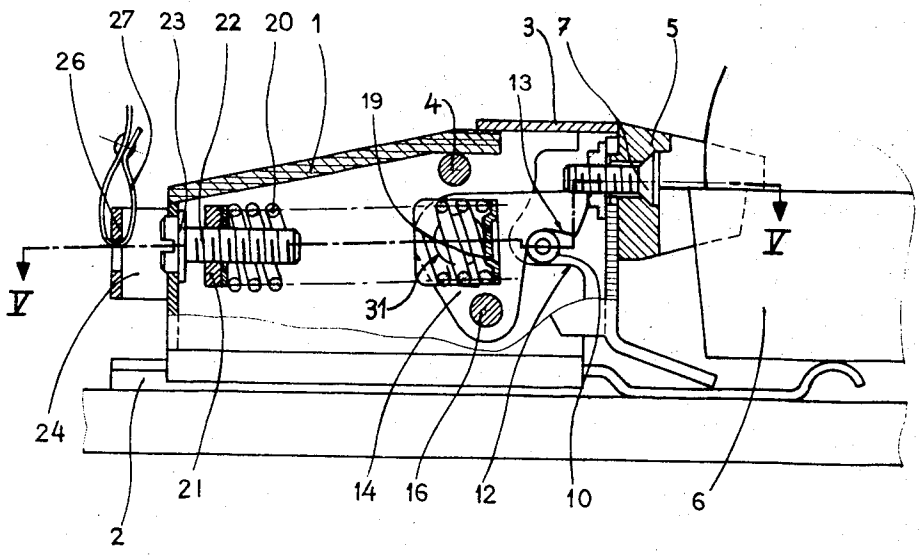
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Fig. 3

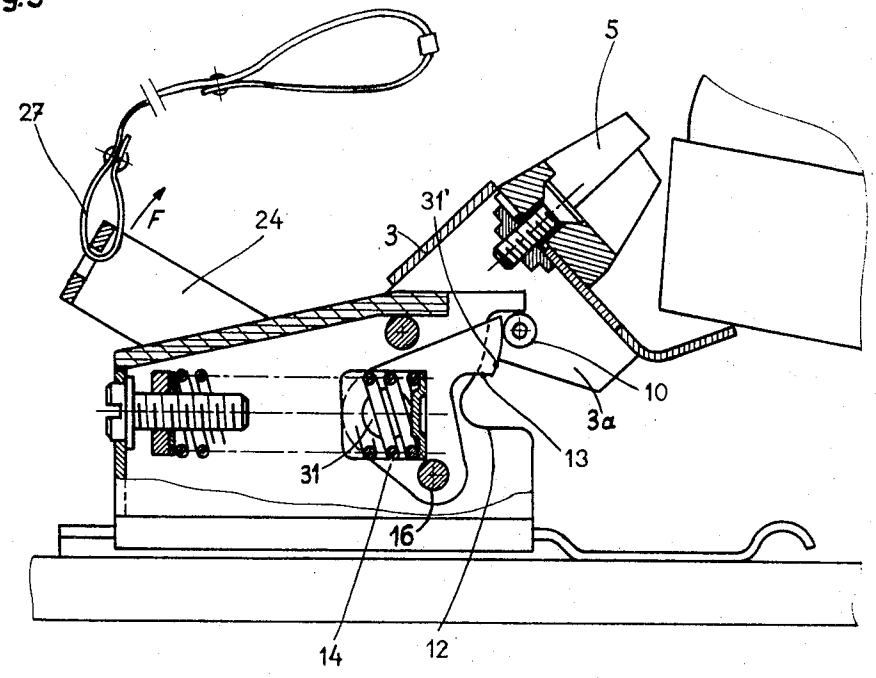


Fig. 4

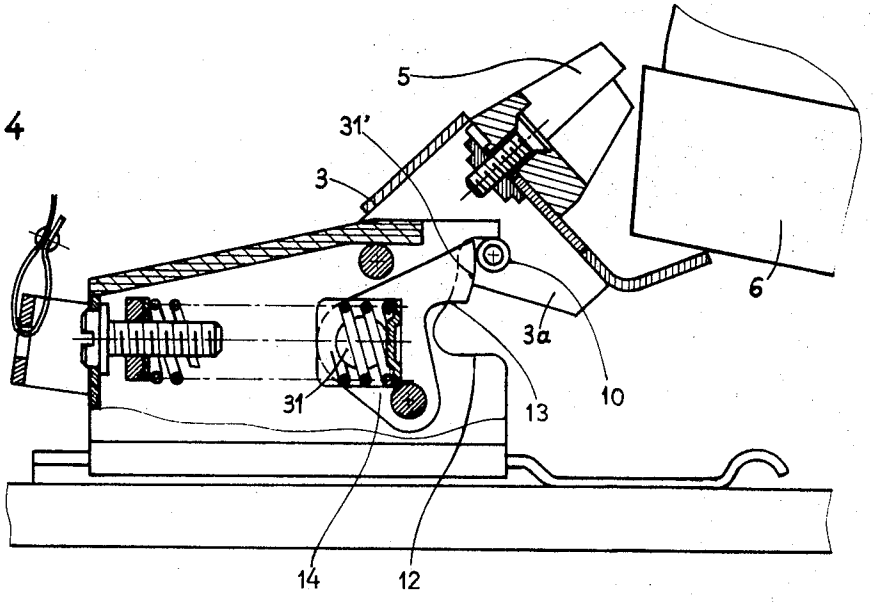
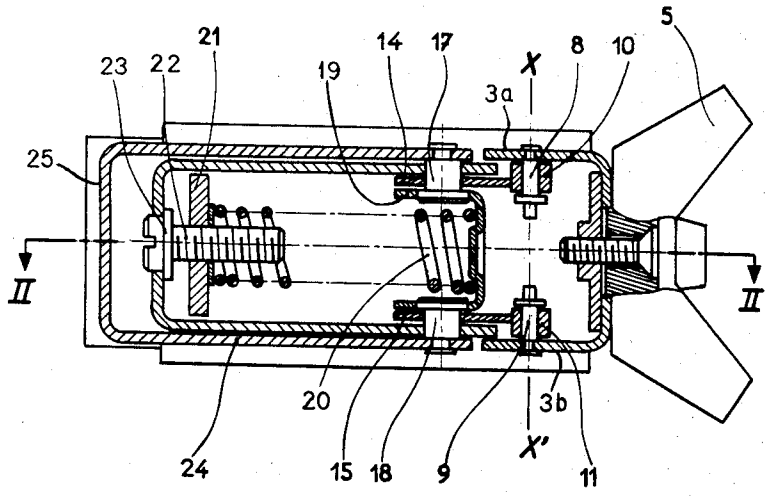


Fig. 5



SKI BINDING

FIELD OF THE INVENTION

The present invention relates to safety ski bindings adapted to normally retain the skier's boot on the ski and to release said boot when the lifting effort applied thereto exceeds a predetermined adjustable value, said device comprising a movable piece permitting voluntary release by means of a strap attached thereto, against the force of a compression spring.

DESCRIPTION OF THE PRIOR ART

A device of this general type is already disclosed in French Pat. No. 1,529,161 in which a boot gripping member pivotally held between two jaws is urged to a closed position by a transversal compression spring. When the boot release strap is pulled this spring is compressed, thus opening the aforesaid jaws. Considering the relatively large force of this spring, voluntary boot release requires a substantial effort on the part of the skier.

SUMMARY OF THE INVENTION

It is an object of the present invention to facilitate the voluntary release of a ski boot attached to a ski, by pulling a strap to actuate a particularly simple and economical mechanism requiring a reduced number of parts.

The ski binding according to this invention comprises a stirrup piece pivoted to the fastening case, frame or mounting structure by means of a pair of lateral rivets adapted to move along apertures formed in said case, and that said case carries at least one stop member adapted to be engaged by said stirrup, the stirrup being also adapted to rotate by reacting against said stop, said rivets having the dual purpose of compressing said spring and releasing the boot retaining member.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view showing the device holding a boot on a ski;

FIG. 2 is a section taken along the line II—II of FIG. 5;

FIG. 3 is a section taken along the line II—II of FIG. 5 but in the position corresponding to voluntary boot release;

FIG. 4 is a section also taken along the line II—II of FIG. 5, showing the device in a position corresponding to the automatic release of the ski binding; and

FIG. 5 is a plan view of the device partly in cross section along line V—V of FIG. 2.

DESCRIPTION OF A PREFERRED EMBODIMENT

The ski binding comprises a hollow structure or case 1 secured to the top surface of a ski by means of a base plate 2, in the known fashion. This case 1 carries a member 3 pivoted about a fixed transverse shaft 4 and carrying a fork-like piece 5 adapted to normally engage the front and top surfaces of the heel of a ski boot 6 and constituting a heel hold-down member. The piece 5 is secured to the member 3 in the usual manner by means of a screw 7 such that the vertical position of the piece is adjustable as a function of the thickness of the boot sole.

The aforesaid member 3 is hollow like the case 1 and carries two pins 8, 9 lying along the same axis X—X' (FIG. 5), said pins being riveted to the side walls 3*a* and 3*b* of said member 3. Mounted for free pivotal movement on these pins 8, 9 are a pair of cylindrical rollers 10, 11 respectively, having polished outer surfaces. In the normal skiing position these rollers rest on two edge surfaces 12 on the side walls of the case 1, one of these two surfaces being visible in FIGS. 2, 3 and 4. The movable member 3, as shown in FIG. 2, is prevented from being raised and thus freeing the ski boot by the action of the surfaces 13 of a pair of flat plates 14, 15 of which only one is visible in this Figure. These two plates 14, 15 are adapted to pivot freely about shaft 16 fixed on the side walls of the case 1 and comprises retaining means for retaining the member 3 in the boot holding down position.

The plate 14 is also provided with a circular hole 31 fitting freely about the body of a cylindrical rivet 17. Similarly, the other plate 15 receives therethrough a rivet 18. To the relatively large diameter of the heads of these rivets 17, 18 is secured a U-shaped member 19 pivoting freely thereabout and retaining by its central portion one end of a compression spring 20 as shown in FIGS. 2 and 5 the other end of this spring bearing against an angularly fixed flat nut 21. A screw 22, prevented by a collar or shoulder portion 23 of its head from being forced out from the case 1, is adapted to be screwed at will in said nut 21 so that the skier can adjust the compression of spring 20.

It can be seen from FIGS. 2, 3 and 4 that rotation or pivotal movement of the two plates 14 and 15 about shaft 16 permits, by means of rivets 17, 18 and U-shaped member 19, variation of the compression of spring 20. The rotation of the plates is controlled by means of a stirrup piece 24 disposed externally of the case 1 and having crimped or set in its side arms the outer ends of rivets 17 and 18 which are generally transversely aligned as shown in FIG. 5, the central portion 25 of this stirrup having an aperture provided with a flexible strap 27 the free end of which is formed into a loop 28 adapted to be bastened around the skier's leg.

The rivets 17 and 18 extend through elongated slots 26 (see FIG. 1) in the respective laterally spaced opposed side walls of the case 1 and the slots 26 are arcuate and centered about the axis of the shaft 16.

In the normal position, FIG. 1, the lower edges of the stirrup piece 24 engage against a pair of stationary symmetrical bosses 29 formed on the outer side of the walls of case 1. Another pair of the stationary symmetrical bosses 30 limits vertical translational movement of said stirrup piece 24.

The above-described safety ski binding operates as follows:

In the normal downhill skiing position illustrated in FIGS. 1 and 2, the skier's boot is urged against the top surface of the ski as a result of the compression of spring 21 tending to rotate, through U-shaped member 19 and the pair of rivets 17, 18, the two plates 14 and 15 in the clockwise direction as seen in these Figures, and the surfaces 13 of each plate 14, 15 engaging the rollers 10, 11 respectively urge the member 3 and fork-like piece 5 against the top edge of the boot heel.

When the skier desires to release his boot, it is simply necessary to pull the strap 27 in the direction of the arrow F, FIG. 3. Thus, the stirrup piece 24 is raised and reacts against the side stops 30 to pivot about these stops in the clockwise direction, thus driving the pair of rivets 17, 18 along the slots 26 so that the plates 14, 15 pivot about the shaft 16 in the counterclockwise direction, thus releasing the pair of rollers 10 and 11. The

boot is no longer held against upward movement, and can thus move the fork-like piece **5** upwards, so as to be released.

When skiing downhill, the skier tends to lift his boot but the heel hold-down device prevents this movement through the resistance of the compression spring **20** and its associated members **19, 14** and **15,** rollers **10, 11** carried by member **3,** and finally fork-like piece **5.** If the skier's boot heel, as a consequence of an abnormal effort, a shock or a forward fall, is subjected to an upward effort greater than the preadjusted force of spring **20,** the binding releases to assume the configuration shown in FIG. **4.** Thus, the top edge of heel **6** exerts an upward thrust against the fork-like piece **5** and causes the rollers **10, 11** to raise the plates **14, 15.** When the rollers **10, 11** leave the retaining surfaces **13,** the fork-like piece **5** can pivot freely and therefore the boot is fully released.

Whether the skier has released the boot from the ski, voluntarily or otherwise, the fork-like piece **5** rests in the upper position shown in FIGS. **3** and **4,** the rollers **10, 11** bearing against retaining surfaces **31',** until the boot is restored to its normal position held on the ski. This can be achieved simply by stamping down the boot heel onto the pedal member fixed to the member **3.**

The above described embodiment concerns a heel hold down device, but it will readily occur to those conversant with the art that the invention is also applicable to the toe retaining element of a ski binding, usually referred to as the toe piece binding, without departing from the scope of the invention.

Obviously, the use of a safety binding according to this invention will prove particularly advantageous whenever a satisfactory, reliable operation is required, together with an easy release and a very small number of component elements conducive to a particularly low cost.

What is claimed is:

1. A safety ski binding device comprising: a casing having laterally spaced opposed side walls; a boot hold-down member pivotally mounted on said casing for movement between a boot holding-down position and a boot-releasing position; retaining means pivotally mounted on said side walls for pivotal movement between a first position wherein said retaining means engages a cooperating part of the boot hold-down member to retain the hold-down member in said boot holding-down position and a second position wherein said retaining means disengages said part of said boot hold-down member and frees the boot hold-down member to pivot to and from said boot-releasing position; spring means in said casing for urging said retaining means towards the first position; a pair of generally transversely aligned shafts each passing through an aperture in each of said side walls and through said retaining means; a stirrup piece mounted on the exterior of said side walls for pivotal movement about said shafts; means mounting said shafts for movement between corresponding first and second positions relative to said aperture when said retaining means moves between its first and second positions; at least one stop member on said side walls engageable with said stirrup piece; and means mounting said stirrup piece for manual movement into engagement with said stop member followed by pivotal movement of said stirrup piece about said stop member to move said shafts from their first position to their second position.

2. A safety ski binding device according to claim **1;** wherein said retaining means has a pair of cam surfaces releasably engageable with said cooperating part of said boot hold-down member to maintain the latter in said boot holding-down position.

3. A safety ski binding device according to claim **2;** wherein said cooperating part comprises a pair of rollers mounted on said boot hold-down member.

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