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Salomon

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[54] **SKI BINDING WITH LATERAL RELEASE**

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

[51] **Int. Cl.** **A63e 9/00**

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

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[57] **ABSTRACT**

A ski binding intended to ensure retention of a ski boot and the release thereof whenever a predetermined load is applied to the boot laterally in the plane of the ski; it includes a base plate attached to the ski, a lever mechanism hinged to a vertical axis on the base plate cooperating with a jaw holding the boot and with a stationary stop integral with the base plate, and a resilient means restoring the lever mechanism to a position against the stationary stop. The cooperation between the jaw and the lever mechanism is achieved by means of a system of axes and guide ramps ensuring release of the binding by means of relative movement between the jaw and the lever mechanism.

6 Claims, 5 Drawing Figures

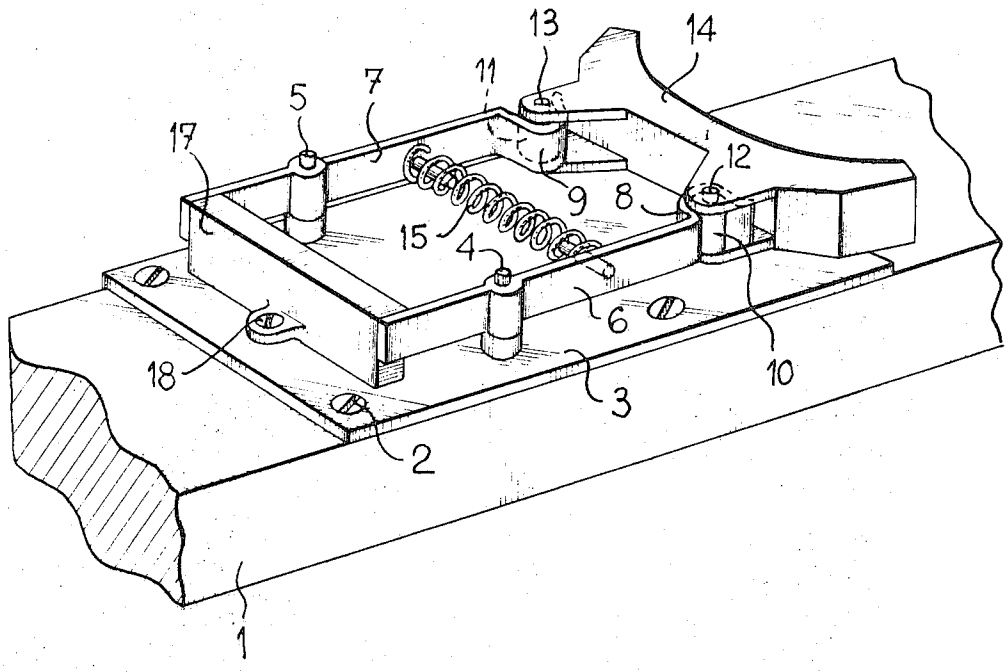

FIG. 1

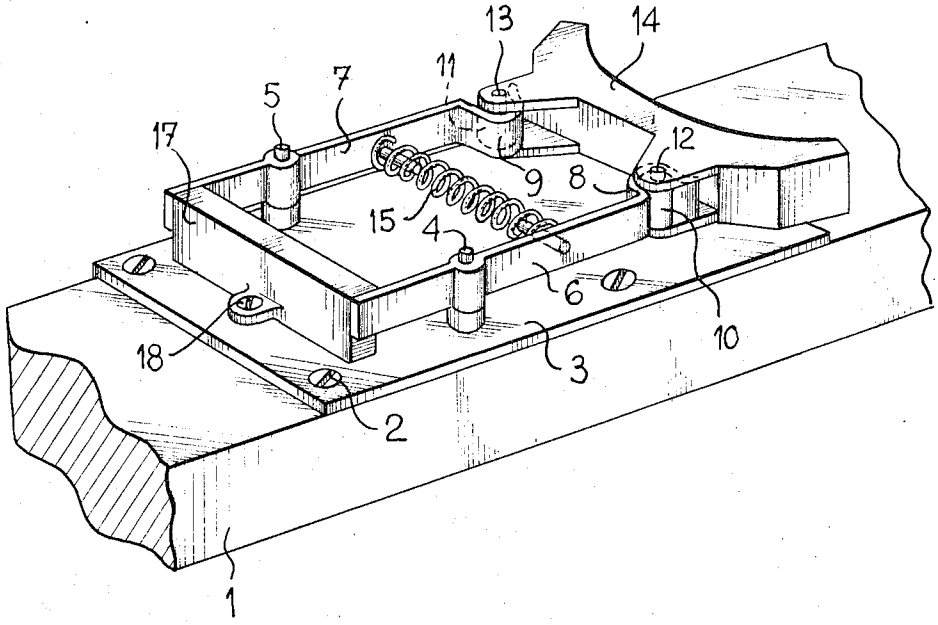
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FIG. 2

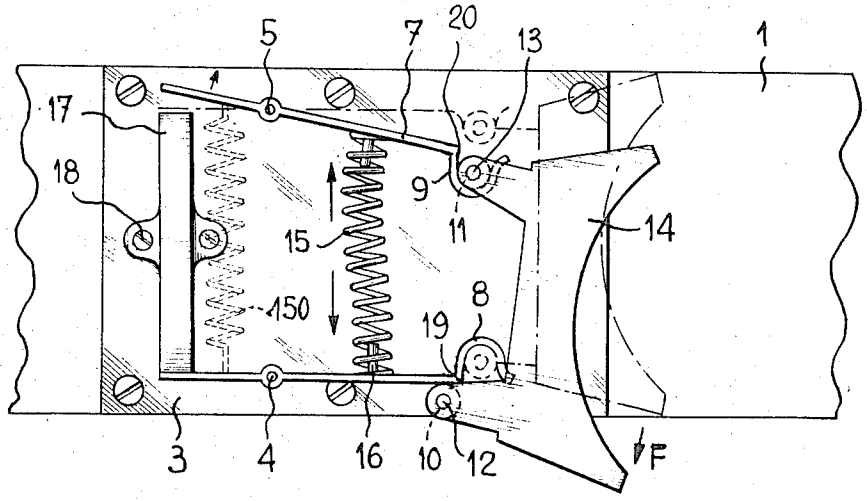
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Fig.3

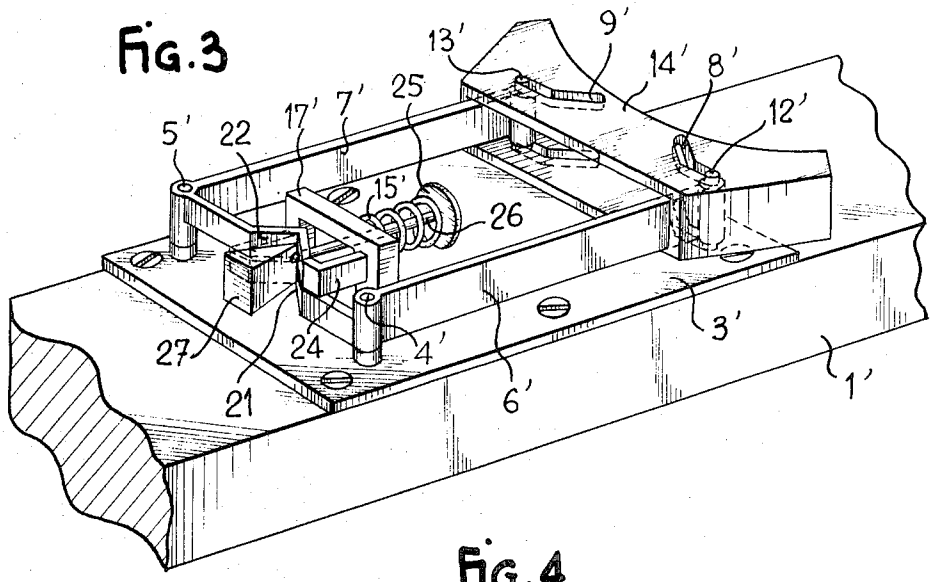


Fig.4

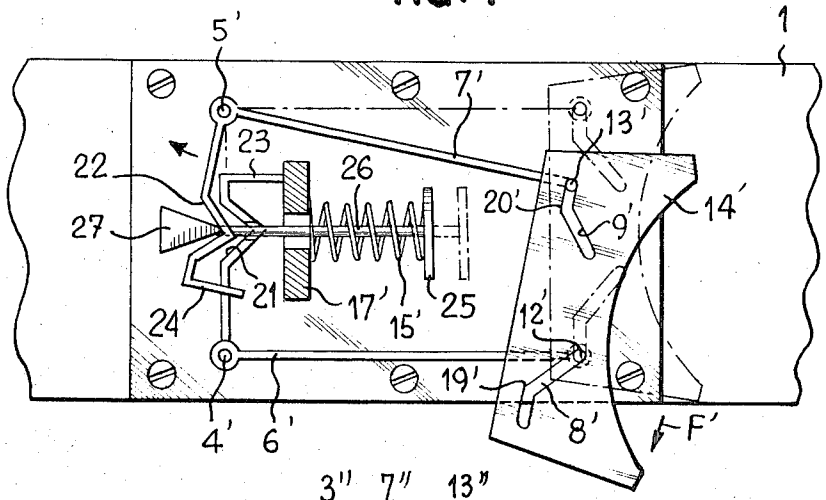
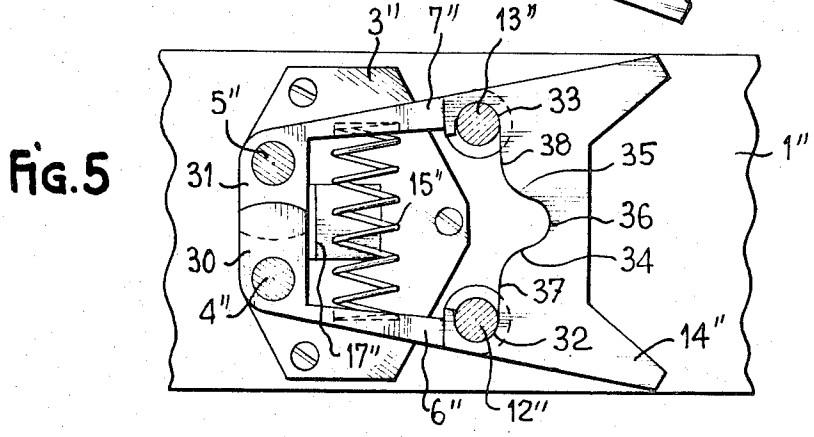


Fig.5



SKI BINDING WITH LATERAL RELEASE

The present invention relates to a resilient safety ski binding adapted to ensure release of the boot in the plane of the ski ater a specific amount of travel, the jaw of the binding being mounted on levers.

Bindings are already known in which the jaw is hinged to converging levers causing the jaw to follow the displacements of the sole but preventing it from being released. An independent mechanism is further needed to release the axes of rotation of the levers in order to ensure the safety release. A design of this kind has the disadvantage of complexity.

Also known are bindings wherein levers mesh with the jaw, the movements of which are guided by co-operation between a stationary ramp integral with the ski and rollers carried on the jaw. This design is also complex and requires both a double meshing profile and a ramp-and-roller guide system.

Moreover, in these two preceding cases, it is impossible to obtain an automatic return of the jaw to its axial position on the ski after a safety release has taken place.

It is an object of this present invention to considerably simplify the construction of bindings of this type and to provide an automatic return of the jaw so that the ski is ready to be put on again after a safety release.

According to one form of the present invention, the jaw is mounted on levers with a system of ramps and axes which ensure both resilient movement and release of the jaw. It is particularly desirable for the ramps to be in two separate pieces separated by a release edge, the first piece permitting the jaw to follow the sole during its resilient travel with no relative motion (hence friction) between them, while the second piece enables a deflection of the jaw with complete release of the sole. The ramps may, of course, be on the levers or on the jaw; in the first case, the jaw will carry the axes or rollers while, in the second case, the levers will carry them.

In another form of the present invention, the levers, which are subjected to the action of a spring or springs, come to rest against a fixed or adjustable part which prevents any uncontrolled movement.

Regardless of the shape of the ramps, the jaw may follow the movement of the sole during the resilient travel merely because it rotates about two axes which are farthest away from the wing on which a load is applied by the sole.

Various embodiments of the invention will now be described by way of examples only, and in no sense restrictively, with the aid of the attached drawings, wherein:

FIG. 1 is a schematic perspective view of a first form of the invention;

FIG. 2 is a schematic plan view showing the device in FIG. 1 in two positions;

FIG. 3 is a schematic perspective view of a second form of the invention;

FIG. 4 is a plan view showing two operating positions of the device in FIG. 3; and

FIG. 5 is a plan view of another variant of the invention.

In FIGS. 1 and 2, numeral 1 represents a part of a ski to which a base plate 3 is attached by means of screws 2. Base plate 3 has two vertical axes 4,5, on each of which respective levers 6 and 7 are mounted to rotate freely, the levers extending in both directions from the axes on which they are mounted.

Levers 6,7 are substantially parallel with the base plate and they run in the direction of the longitudinal axis of the ski.

One end of each lever carries a housing 8,9 receiving a roller 10,11 rotating upon an axis 12,13 integral with the rear portion of a jaw 14 designed to accommodate one end of a boot (not shown). Rollers 10,11 are preferably located, as shown, in the forks of the jaw, and it will be understood that in this type of arrangement jaw 14 is supported on the ends of levers 6,7.

The ends of the levers carrying the jaw are loaded in such a manner that they tend to move away from each other. In the example illustrated, the load is applied by means of a spring 15 in compression which is located between axes 4–5 and front ends 8–9 of the levers. The ends of the spring rest against the levers and are maintained in position by pins 16.

As an alternative, it would be possible to replace compression spring 15 by tension spring 150 shown in dotted lines in FIG. 2, in which case the spring would be hooked to the ends of the levers remote from the ends carrying jaw 14. Yet another alternative would be to have both spring 15 and spring 150 acting upon the levers in the same way.

A stop 17, attached to base plate 3 by means of screws 18 is located substantially in the axis of the ski and between the rear ends of the levers; the stop opposes the load applied to the levers by the spring or springs. It will be observed that depending on the length of the stop, levers 6,7 will be parallel or will converge or diverge towards jaw 14. Moreover, the angle between the levers and the longitudinal axis of the ski may have any value. The distance between rollers 10,11 and the jaw will of course depend upon the arrangement of the levers. In any case, in the position of rest (FIG. 1), rollers 10,11 are located in housings 8,9, so that there is no play in the jaw.

It should also be observed that the release load may be very easily adjusted by moving the springs towards or away from axes 4,5, by sliding the springs along the levers.

Housings 8,9 may be obtained, as in the example illustrated by bending the ends of the levers to form a semi-circular hook having a ramp portion defining with the straight part of the lever a release edge 19,20.

This binding operates as follows: when a significant load, indicated by arrow F in FIG. 2, is applied by the boot to jaw 14, roller 11 causes the lever 7 to rotate about its axis 5 against the action of spring 15. During this rotation, roller 11 is therefore displaced to some extent. Simultaneously, roller 10, moving towards release edge 19, rolls on its ramp portion which, like lever 6, remains practically stationary. Thus, even if the ramp portion of the hook is perpendicular to lever 6, the jaw will follow the movements of the boot and will therefore not rub against it. It should be noted that the angle between the ramp portion and the straight portion could be given a value of less than the value $\pi/2$ illustrated in the FIGURE. When roller 10 passes beyond edge 19 (FIG. 2), the jaw may immediately rotate about roller 11, thus completely releasing the boot. Since spring 15 tends to separate the levers, the jaw automatically returns to the position of rest (shown in dotted lines) after load F ceases to be applied, because

of the shape of the second part of the ramp, i.e., the straight portion of the lever.

In FIG. 3, parts having the same functions as in FIGS. 1,2 bear the same reference numerals with the addition of a prime mark, even if they are not located on the same members. It will thus be seen that, in this embodiment, ramps 8',9' are cut out of the rear portion of jaw 14', and that axes 12',13' are on levers 6',7', which makes no change whatever in the functioning of the device. However, beyond axes 4',5', the levers are inwardly bent with ends having a V-shaped profile 21,22 open towards the outside. Seen from above, these V profiles are merged into the same plane because they are superimposed. The profiles are extended by elbows 23,24 which are stopped against the outer face of a part 17' which is attached to the base plate and prevents any uncontrolled movement of the levers. The latter are subject to the action of a spring 15', one end of which is in contact with the inside face of stop 17' while the other end rests against a washer 25 integral with an axis 26 located axially within the spring. This rod passes through an aperture in part 17' and between V profiles 21,22. The axis 26 carries at its outer end a profile 27 in the shape of a wedge which is in contact with the bottom portions of V profiles 21,22 and applies elbows 23,24 to part 17'. In order to ensure maximal rigidity in the unit, levers 6',7' may be of a suitable height in a plane perpendicular to the ski, or each one may consist of two superimposed levers which merge when seen in a plan view. These two pairs of levers form a cage-like housing containing spring 15' and part 17'. In this case, the jaw obviously also carries two pairs of ramps.

The unit operates as follows: if the sole applies a load to the jaw in the direction of arrow F, profile 9' carries along lever 7' which rotates about axis 5' (FIG. 4). As soon as axis 12' passes edge 19', the jaw rotates abruptly about axis 13' and rleases the boot. Since the levers are restored to the position shown in FIG. 3 by spring 15', the jaw returns to the position of rest (shown in dotted releases because of the shape of the second part of the ramp.

A third example of embodiment will now be described with reference to FIG. 5, in which parts performing the same functions as in FIGS. 1 to 4 bear the same reference numerals with the addition of a double prime mark even if they are not located on the same members. In this alternative, levers 6'',7'' are loaded by a spring 15'' which tends to separate them. Rear ends 30,31 of the levers are bent at right angles and rest against a stationary stop 17'' which may consist, for example, of a part of base plate 3'' cut and bent vertically. Axes 12'',13'' carried by the levers are located in housing 32,33 in a single profile formed on the rear portion of jaw 14'', the profile having rounded release edges 34,35 on each side of a common central release zone 36. Resiliency ramps 37,38 run between release edges 34,35 and corresponding housings 32,33.

It will be observed that, in this example, the levers diverge from axes 4'',5'' towards axes 12'',13''.

This binding functions in the same manner as the preceding alternatives and will therefore not be described in detail.

The mechanisms described in this present application may be used without distinction in any safety-binding device, regardless of its location in relation to the ski or the boot, and regardless of any other functions or releases that may be associated or juxtaposed therewith.

I claim:

1. A safety ski binding intended to ensure retention of a ski boot and the release thereof whenever a predetermined load is applied to the boot laterally in the plane of the ski, said binding comprising: a base plate attached to the ski; a pair of pivots vertically extending from said base plate; first and second levers respectively hinged on said pair of pivots, each lever having first and second portions extending from said pivot, said first portion extending substantially longitudinally of said ski; a boot holding jaw mounted on said first portion of said levers; attachment means on said jaw permitting relative movement between said jaw and said lever portions, said attachment means including a system of vertical axes and guide ramps respectively integral with said jaw and said levers; a stationary stop integral with said base plate; and resilient means for applying each said second portion of said lever against said stationary stop.

2. A safety ski binding as defined in claim 1, wherein said vertical axes of said system are respectively integral with each said first portion of said levers, said guide ramps being provided in said jaw.

3. A safety ski binding as defined in claim 2, wherein said guide ramps provided in said jaw define respectively two zones of travel for the axes of said system, said zones being separated by a release edge, the first zone being a zone of resilient travel of said jaw, the second zone being the zone of opening of said jaw.

4. A safety binding as defined in claim 3, wherein the second zones of opening of said guide ramps converge toward a median portion of said jaw and are inclined in the direction of said boot.

5. A safety ski binding as defined in claim 3, wherein said first zone includes, opposite to said release edge, a housing in which one of said axes is received.

6. A safety ski binding as defined in claim 1, wherein the ends of the levers cooperating with the stationary stop run transversely of the length of the ski and are superimposed in a single vertical plane.

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