United States Patent

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[54] **FRONT PORTION OF A SAFETY SKI BINDING**
4 Claims, 7 Drawing Figs.

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[51] Int. Cl. A63c 9/00
[50] Field of Search 280/11.35

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ABSTRACT: In the front portion of a safety ski binding having a front jaw swingable about a vertical axis, which can be latched into a normal position, there is provided a sole retainer swingable about a horizontal transverse axis, wherein the device for swinging the front jaw about its vertical axis and the device for swinging the sole retainer about its horizontal transverse axis are each mechanically coupled to one another in such a manner that the sole retainer swings upward about its horizontal transverse axis upon the sidewise swinging of the front jaw.

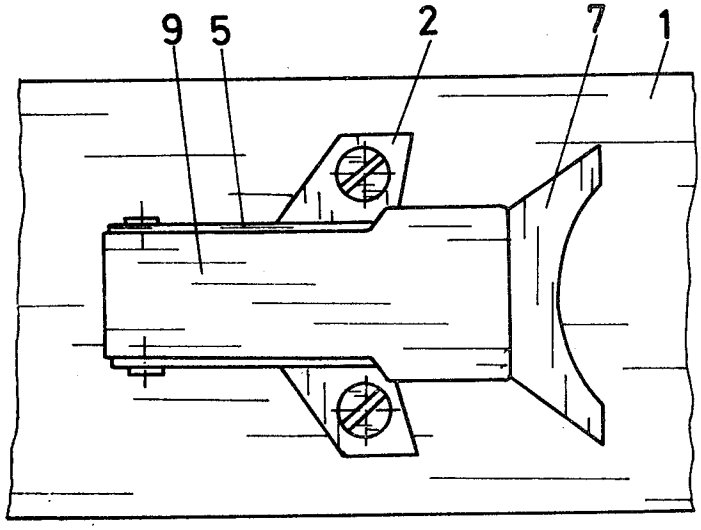


Fig. 1

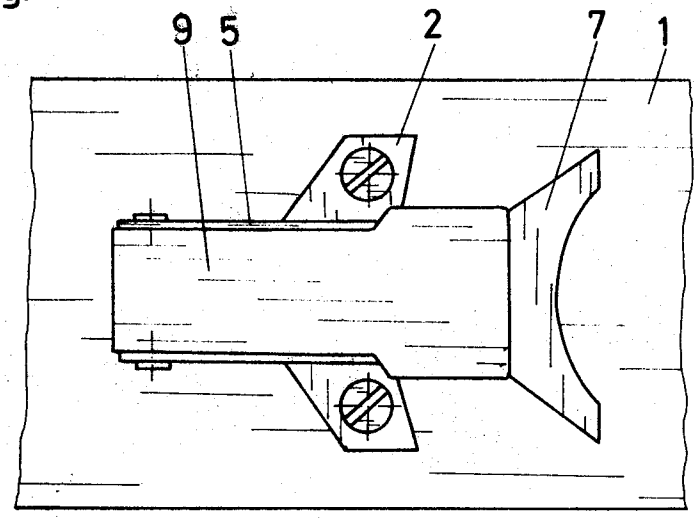


Fig. 2

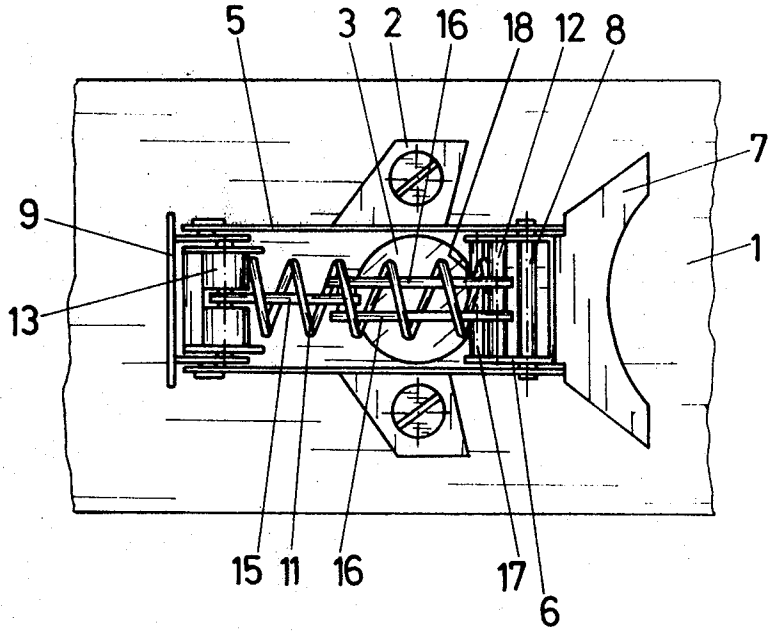


Fig. 3

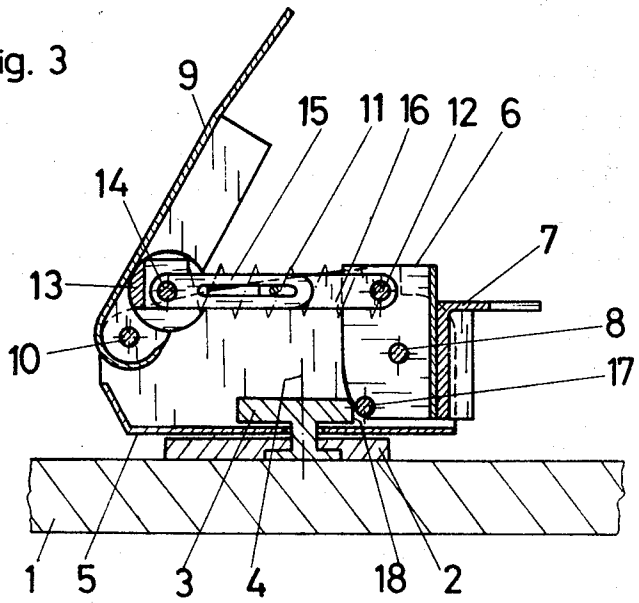


Fig. 4

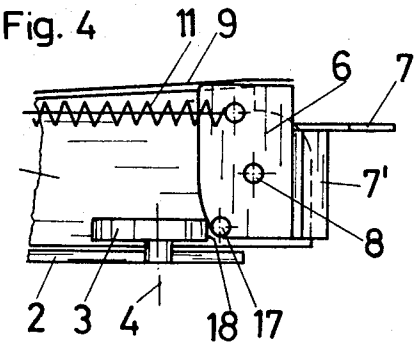


Fig 5

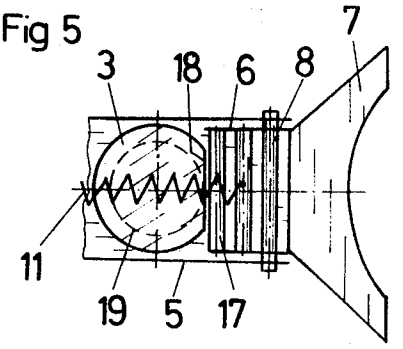


Fig. 6

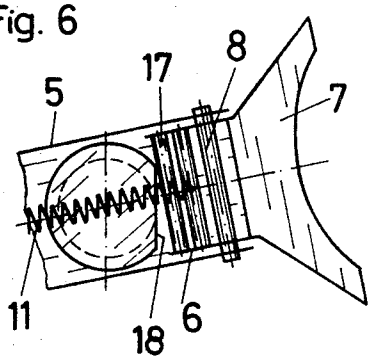
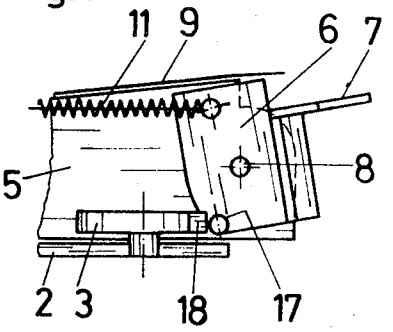


Fig. 7



FRONT PORTION OF A SAFETY SKI BINDING

The present invention relates to a front portion of a safety ski binding a front jaw swingable about a vertical axis which can be latched in normal position and a sole retainer swingable about a horizontal transverse axis.

Numerous embodiments of safety ski bindings providing a front jaw swingable about a vertical axis are known. Moreover a sole retainer of said front jaw swingable about a horizontal transverse axis in known, the swing movement being effected by a spring-loaded bolt lever. Upon the closing of said bolt lever the sole retainer is swung downward in order to retain the sole of the ski boot. Upon the opening of said bolt lever the sole retainer is again swung upward and thus frees the sole of the ski boot. The bolt lever is manually operated upon getting into and getting out of the binding.

In contrast thereto, the invention consists in that the device for swinging the front jaw about its vertical axis and the device for swinging the sole retainer about its horizontal transverse axis are mechanically coupled to one another in such manner that upon the sidewise swinging of the front jaw the sole retainer swings upward about its horizontal transverse axis.

According to the invention the boot front portion is freed more readily upon the sidewise swinging of the front jaw owing to an excessive twisting strain.

In addition, an arbitrary swinging of the sole retainer about its horizontal transverse axis, e.g., in a known way by means of a spring-loaded bolt lever, can be provided in order to facilitate the getting into and the getting out of the binding.

The invention is hereinafter described more in detail with reference to the accompanying drawings.

FIG. 1 shows the front portion of a safety ski binding in top view, the bolt lever being closed.

FIG. 2 is a top view, the bolt lever being open, and FIG. 3 is a longitudinal section, the bolt lever being open, and FIG. 3 is a longitudinal section, the bolt lever being partially open.

FIGS. 4 to 7 are schematic views of the essential operating parts in normal position, the bolt lever being closed (FIGS. 4, 5) and in swinging position owing to an excessive twisting strain.

The front portion of the front jaw of a safety ski binding as shown comprises a baseplate 2 to be firmly secured (screwed) to the ski 1 on which a disc 3 is mounted, not capable of rotation, the swing casing 5 of the front jaw being pivotally mounted about the vertical axis of said disc. In the swing casing 5 a link body 6 supporting the sole retainer 7 is pivotally mounted about a horizontal transverse axis formed by the bolt 8. At the other end of the swing casing 5 the bolt lever 9 is pivotal about the bolt 10. Between the link body 6 and the bolt lever 9 a compression spring 11 is provided which supports against the bolt 12 of the link body 6 on the one hand and against the supporting body 13 on the bolt lever 9 on the other hand. The supporting body 13 is pivotal about the bolt 14 and comprises three supporting surfaces lying in a different distance from the axis of the supporting body 13 which are used for supporting the compression spring 11 (on which tension depends the releasing force of the front jaw) in accordance with the required releasing force of the front jaw. A divided extensible lever system 15, 16 serves for guiding the compression spring, one part 15 being pivoted to the bolt 14, the other part 16 to the bolt 12.

Furthermore, a bolt 17 is arranged at the link body 6 in a distance below the horizontal transverse axis 8, said bolt 17 tightly resting against the front side 18 of the disc 3, when the bolt lever 9 is closed and in normal position of the swing body 5. The front surface 18 of the disc 3 passes along a sinew or chord of the usually circular circumference of the disc. The front surface 18 and the side of the bolt 17 facing the disc 3 form the essential latch and control surfaces for obtaining the effect of the invention, wherein upon the sidewise swinging of the swing casing 5 of the front jaw the sole retainer 7 swings upward about its horizontal transverse axis 8. The latter is hereinafter described more in detail with reference to the FIGS. 4 to 7.

In FIGS. 4 and 5 the front jaw is in normal position the bolt lever 9 being closed. The compression spring 11 presses on the link body 6, e.g., in a distance above the horizontal transverse axis 8, thus retains the sole retainer 7 and makes the bolt 17 rest against the front surface 18 of the disc 3 of the baseplate 1. Thus, the swing casing 5 is in latched position at the front surface 18 of the disc 3 by means of the bolt 17 and is therefore secured against swinging movements about the vertical axis 4.

This is only true for as long as no excessive torsional forces act on the swing casing 5. If however, in the case of a fall, strong torsional forces being capable of separating the contact pressure produced by the compression spring 11 over the link body 6 between the bolt 17 and the front surface 18 of the disc 3, then—as can be seen in FIGS. 6 and 7—the swing casing is able of swinging laterally, the bolt unilaterally lifting from the front surface 18 of the disc 3. As, however, the disc 3 is firmly connected with the ski through the baseplate 2 and the swing casing 5 cannot perform any longitudinal displacement relative to the disc 3, the lifting of the bolt 17 from the front surface 18 of the disc 3 necessarily causes a swinging of the link body 6 and thus of the sole retainer 7 about the horizontal transverse axis 8. The front jaw not only swings aside, but the sole retainer 7 (see FIG. 7) also swings upward, whereby the front sole zone of the ski boot is certainly freed.

It can be seen from the aforesaid that in the illustrated embodiment the side of the bolt 17 facing the disc 3 and the front surface 18 of the disc serve as latch surfaces in the normal position of the front jaw and as control surfaces upon the sidewise swinging of the front jaw for the necessary upward swinging of the sole retainer during the swinging of the front jaw.

Said latch and control surfaces may also have a different configuration. It is essential, however, if the other essential constructional features of the front jaw according to the shown embodiment are maintained, that the latch and control surface of the baseplate 2 (in the case as illustrated it is the front surface 18 of the disc 3) is less curved (or has a larger radius of curvature) than the circle of contact 19 (FIG. 5) drawn about the vertical axis of rotation of the front jaw (axis 4 of the swing casing 5), the latch and control surface (in the case as shown this is the surface of the bolt 17) of the sole retainer contacting said circle in normal position (racing position) of the front jaw. For example, a curved-front surface could be provided on the disc 3 instead of the plain front surface 18 (curvature=0, radius of curvature=∞), but having a smaller curvature than the circle of contact 19. The disc 3 could, for example, have the contours of an ellipse whose longer main axis is normal to the longitudinal axis of the front jaw. The latch and control surface of the sole retainer need not necessarily have the configuration of a bolt, either. Said latch and control surface could be, for example, a surface of the casing or of the link body shaped accordingly.

Various changes of these embodiments may be made as to the configuration of the latch and/or control surfaces on the baseplate firmly connected with the ski (or on an element firmly connected therewith) on the one hand and on the sole retainer swingable about a horizontal transverse axis on the other hand, which also make the sole retainer necessarily swing upward about its horizontal transverse axis upon the sidewise swinging of the front jaw.

The compression spring provided in the shown embodiment may also be replaced by at least one tension spring which, however, has to act on the link body 6 in a distance below the horizontal transverse axis. In this case, of course, another configuration or arrangement of the bolt lever is required. Besides, it is pointed out that the front jaw according to the invention also functions without any bolt lever intended for the release spring (compression spring or tension spring). In this case, of course, an upward swinging of the sole retainer upon getting into and getting out of the binding is not possible, which makes these operations more difficult.

What I claim is:

1. In the front portion of a safety ski binding having a front jaw swingable about a vertical axis which can be latched in normal position, the combination comprising a sole retainer swingable about a horizontal transverse axis on said front jaw, a link body fixed to said sole retainer, said link body being pivotally mounted about said horizontal transverse axis, said front jaw including a baseplate unit fixed to the ski and a casing swingable about said vertical axis relative to the baseplate unit, a first latch and control surface arranged on said link body and vertically spaced from the horizontal transverse axis of the link body and engageable with and lying opposite said first latch and control surface, and at least one release spring acting on said link body at a distance spaced from the horizontal axis of the link body, said combination causing the sole retainer to swing upwardly about its horizontal transverse axis upon the sidewise swinging of the front jaw.

2. In the front portion according to claim 1 said first latch and control surface of the baseplate unit lying essentially normal to the base plane of the baseplate unit and having a curvature in plan view which is less than the curvature of the circle of contact of said second latch and control surface of said link body drawn about the vertical axis of said casing in the normal position of said casing.

3. In a front portion according to claim 2, said baseplate unit comprising a baseplate and a disc connected with the baseplate, said disc being incapable of rotation and projecting into said casing, said first latch and control surface being arranged on said disc.

4. In the front portion according to claim 3 said first latch and control surface of the baseplate being arranged along a chord of said disc.