March 9, 1965 H. MARKER 3,172,677

ADJUSTABLE SPRING-LOADED POSITIONING DEVICE IN SAFETY-SKI BINDINGS

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FIG.1.

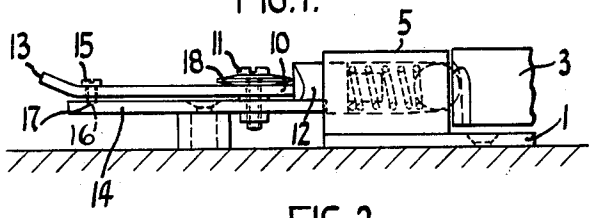


FIG.2.

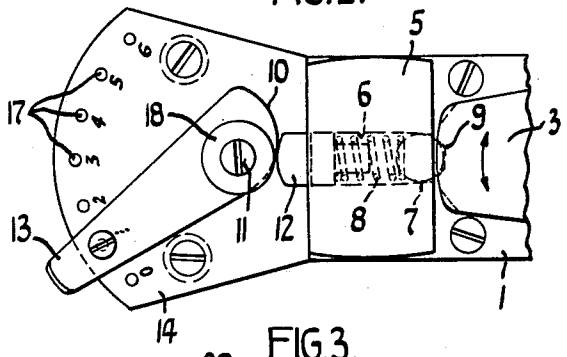


FIG.3.

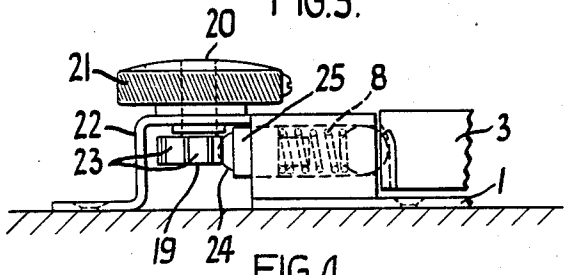
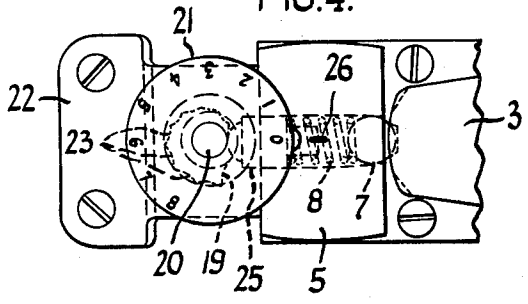


FIG.4.



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FIG.5.

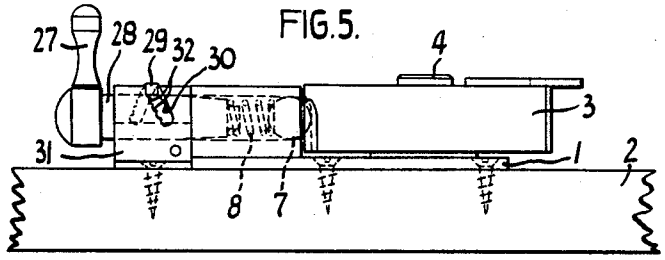


FIG.6.

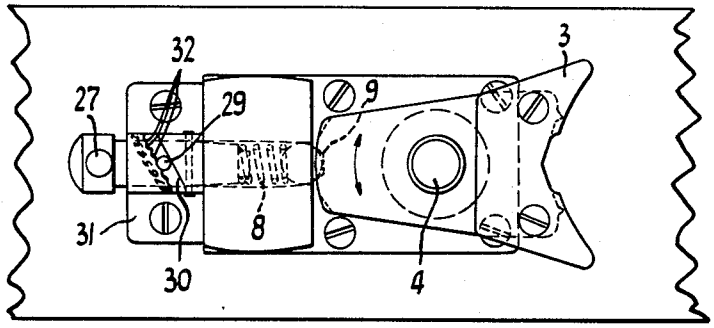


FIG.7.

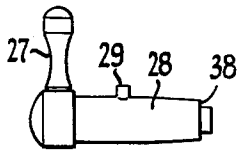
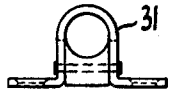


FIG.8.



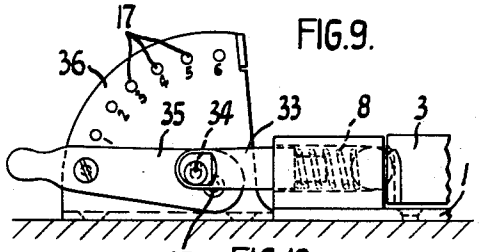
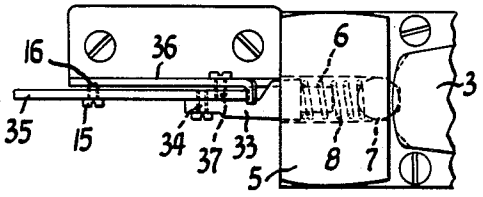


FIG.9.

FIG.10.



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ADJUSTABLE SPRING-LOADED POSITIONING DEVICE IN SAFETY-SKI BINDINGS

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Claims priority, application Germany, July 21, 1960, M 45,997
6 Claims. (Cl. 280—11.35)

The invention relates to an adjustable detent device on safety ski bindings, in which a setting member exerts an adjustable pressure on a detent member through a spring element. Hitherto a setting screw provided with a fine thread or a normal thread has been used as a setting member. However, such a setting screw has the disadvantage that for adjusting the detent device from the minimum up to the maximum pressure, the setting screw must execute more than one revolution, so that even when using an index, a specific setting of the detent device as selected by the skier does not in any way guarantee that a specific detent pressure as required is obtained. It is quite possible that the setting member adjusted to a predetermined detent pressure and a predetermined marking or setting can in error or unintentionally (for example due to vibration with motor transport) be turned through a complete revolution or even several revolutions, so that this incorrect setting cannot be detected by the eye.

In order to obviate this disadvantage, with the adjustable detent device according to the invention, the setting member held in its actual position by several detents is so constructed that all settings of the detent device are obtained by swinging or swivelling the setting member through an angle smaller than 360°. In accordance therewith, a comparatively large stroke must be produced with the setting member during this swinging movement. Such a stroke or travel can advantageously be obtained with a setting member designed as an eccentric cam plate. It is also possible to provide a longitudinally displaceable or rotatably arranged setting member, which is guided in a coarse thread. Finally, it is also possible to construct the setting member as a crank drive.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings wherein:

FIG. 1 is a side elevation of an adjustable detent device on a safety ski binding,

FIG. 2 is the associated plan view,

FIGS. 3 and 4 show another adjustable detent device illustrated by the same views,

FIGS. 5 and 6 show a third constructional form of an adjustable detent device,

FIGS. 7 and 8 show details of this detent device,

FIGS. 9 and 10 show yet another constructional form of an adjustable detent device according to the invention.

In the drawings, the reference 1 designates a base plate which is fixed on a ski 2 and on which a cheek plate 3 which is supported on the front edge of the sole is mounted by a pivot pin 4 so that it can swivel to both sides. The supporting cheek 3 is held in its central position as shown by means of an adjustable detent device, advantageously by a ball-type detent device. In the constructional examples illustrated, a steel ball 7 constituting a detent member is located in a longitudinal hole 6 in a fixed part 5, the said ball being pressed under the action of a helical compression spring 8 into a corresponding socket 9 formed in the cheek 3. In order to enable the turning moment at which the cheek 3 is released to be adjusted as required, a setting member is provided. Referring to the example shown in FIGS. 1 and 2, this setting member is constructed as an eccentric cam disc 10, which

is arranged to pivot about a pin 11. This cam disc 10 acts on the spring 8 through a pressure member 12 longitudinally displaceable in the hole 6 and may be connected to a rocking lever 13. Alternatively, as shown in FIGS. 1 and 2, the disc 10 may be integral with the lever 13. The rocking lever 13 can be latched in various positions in relation to a fixed plate 14. For this purpose, a screw 15 is provided on the rocking lever 13, the point 16 of the said screw latching resiliently as a detent member in corresponding recesses 17 of the plate 14. In order to produce this spring force, a bevelled spring plate 18 is provided which is held by the screw bolt 11 and which urges the rocking lever 13 and thus the end 16 of the screw resiliently against the plate 14. As can be seen from the drawings, the cam disc 10 is so formed that in a range of swinging movement which is indicated by the numbers 0–6, i.e. a range considerably less than 360°, it is possible to effect all adjustments of the detent arrangement 7–9.

In the constructional example shown in FIGS. 3 and 4, an eccentric cam disc or plate 19 is also provided as the setting member, the said plate being rotatable by means of the vertical spindle 20 and a knurled disc 21. The spindle 20 is mounted on a fixed bearing block 22. As will be seen from the drawing, the cam disc 19 has a plurality of depression 23, which can be engaged by the rounded head 24 of a longitudinally displaceable pressure member 25 which acts on the helical spring 8. The setting member 19 is thus held by means of the detent device 23, 24 in its actual position as set by hand. In order to enable adjustment of the setting to be made accurately and to ensure that the actual setting is accurately indicated, an index 26 is provided on the fixed part 5, while suitable numbers, for example 0–8, are provided on the knurled disc 21. In this construction also, the cam disc 19 is so shaped that to obtain any desired setting of the detent device 7–9, the cam disc and the knurled disc 21 only have to be swung through an angle which is less than 360°. Stop devices or abutments (not shown) are preferably provided for limiting the maximum turning range of the knurled disc 21.

Referring to the constructional form shown in FIGS. 5 and 6, the setting member for the detent device 7–9 is arranged to be longitudinally displaceable and rotatable and is guided in a steep thread. The setting member 28 which can be turned by means of a small handle 27 is constructed as a bolt, a pin 29 on which projects into a steep guideway 30. This guideway is constituted by a slot which is formed in the fixed bearing block 31 serving for the mounting of the bolt 28. As will be seen from the drawing, the guideway 30 is provided on one side with a number of recesses 32 which are engaged by the pin 29 under the action of the compression spring 8. The recesses 32 serve as detents and are designated by numbers on the bearing block 31. With this construction also it is possible for all settings of the detent device 6–8 to be achieved by swinging the setting member 28 through an angular range considerably less than 360°. With the constructional form according to FIGS. 5–8, the setting member which is arranged to be longitudinally displaceable and rotatable acts by means of its end 38 directly on the compression spring 8.

FIGS. 9 and 10 show another constructional form, in which the setting member is constructed as a crank drive. This crank drive consists of a crank rod 33 which is guided in the bore 6 of the fixed part 5 and which is supported on the compression spring 8. This crank rod is articulated at 34 on a crank, which is constructed as a rocking lever and which is pivotally mounted about the stud 37 on a fixed plate 36. This rocking lever 35 can be latched in various positions in relation to the plate 36.

In a manner similar to the construction according to FIGS. 1 and 2, the plate **36** comprises a number of depressions **17**, which can be engaged by the pointed end **16** of a screw **15** arranged on the rocking lever **35**. The invention is not limited to the constructional examples which have been illustrated. Instead of the pivoted cheek **3** as illustrated, it is possible to provide a pivotable front cheek of any suitable design, e.g. a supporting cheek articulated by means of a threaded pin on a member arranged to swivel about a stationary bearing pin. In this case, the adjustable detent device according to the invention is not fixed, but rather is it arranged on a pivotable part of the safety binding.

What is claimed is:

1. An adjustable detent device for safety ski bindings, comprising:

a cheek mountable on a ski in a position for engaging the toe of a ski boot, said cheek being pivotable about an axis extending perpendicularly to the ski and having recess means therein;

a housing disposed adjacent said cheek and having an elongated passage therethrough;

a ball disposed in said passage and being movable in a lengthwise direction therealong, said ball being partly extendable through one end of said passage for reception in said recess means to yieldably prevent pivotal movement of said cheek;

a coil spring disposed within said passage and having one end thereof engaging said ball for urging same toward said one end of said passage;

a pressure member engaging the other end of said spring and means supporting said pressure member for sliding movement lengthwise of the passage whereby the compression of said spring and thereby the force urging said ball toward said one end of said passage can be adjusted, said pressure member having an extended end extending away from said housing;

operating means for effecting such lengthwise movement of the pressure member, said operating means including an operating member mounted outside of said housing for arcuate movement about an axis through an arc of less than 360 degrees and including single cam means and cam follower means engaged by said cam means, each connected to one of said housing and said pressure member for operation by said operating member for moving said pressure member lengthwise from its most remote position with respect to said one end of said passage to its closest position; and

detent means for releasably holding said operating member in selectable intermediate positions between the ends of said arc.

2. An adjustable detent device according to claim 1, in which the pressure member is a plunger slidably mounted in the housing and said cam means is connected to said operating member for movement therewith about the rotational axis thereof, the cam means having a cam surface engaging the extended end of said plunger, said extended end comprising said cam follower means.

3. An adjustable detent device according to claim 1, in which said operating member is a shaft having a manually engageable knob mounted thereon for effecting rotation thereof, said cam means comprising a disc mounted on said shaft and having a scalloped peripheral cam surface providing a plurality of circumferentially spaced depressions arranged at different radial distances from said shaft, the end of said plunger comprising said cam follower means and being receivable into said depressions.

4. An adjustable detent device according to claim 1, in which said operating member is a lever, stationary detent means associated with said housing and means on said lever co-operable with said detent means for releasably locking said lever in fixed, selectable positions with respect to said housing.

5. An adjustable detent device according to claim 4, in which the pressure member is a plunger slidably mounted in the housing and in which said cam means is a surface on said lever, said cam surface engaging the end of the plunger for effecting movement thereof in response to pivotal movement of said lever, said end of said plunger comprising said cam follower means.

6. An adjustable detent device for safety ski bindings, comprising:

a housing having an elongated passage therethrough;

a ball disposed in said passage and being movable in a lengthwise direction therealong, said ball being partly extendable through one end of said passage;

a coil spring disposed within said passage and having one end thereof engaging said ball for urging same toward said one end of said passage;

a pressure member engaging the other end of said spring and means supporting said pressure member for sliding movement lengthwise of the passage whereby the compression of said spring and thereby the force urging said ball toward said one end of said passage can be adjusted;

operating means for effecting such lengthwise movement of the pressure member, said operating means including an operating member at least part of which is accessible from outside of said housing for arcuate movement about an axis through one arc of less than 360° and including single cam means and cam follower means engaged by said cam means, each connected to one of said housing and said pressure member for operation by said operating member for moving said pressure member lengthwise from its remote position with respect to said one end of said passage to its closest position; and

detent means for releasably holding said operating member in selectable intermediate positions between the ends of said arc.

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