

United States Patent [19]

Eisenschmid

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[54] ARRANGEMENT FOR SLEDDING BY
MEANS OF SKIS

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[51] Int. Cl. B62b 13/04

[58] Field of Search 280/12 F, 12-37 J,
280/16, 21 A

[57]

ABSTRACT

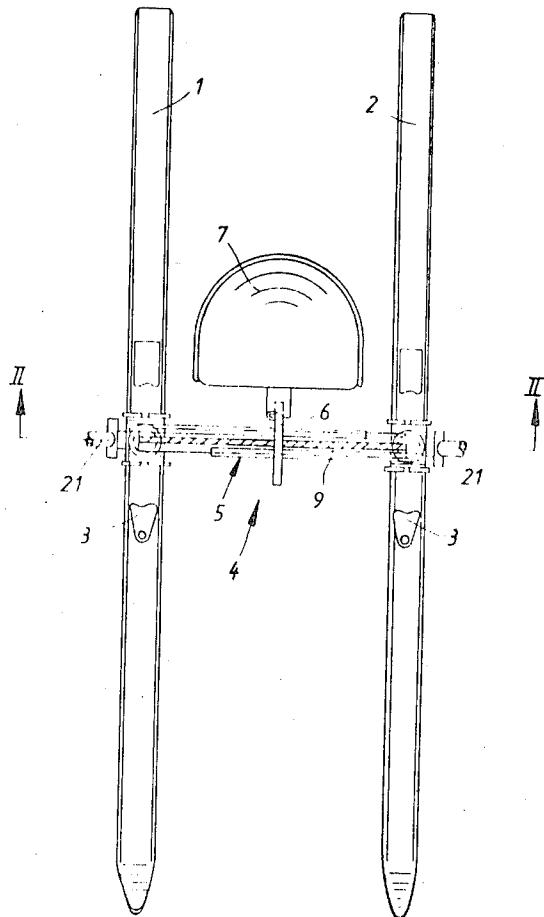
An arrangement for sledding by means of skis comprising a channel-shaped support assembly supporting a seat thereon therein legs of said assembly may be secured to a pair of skis. The arrangement further including a steering lever pivotally secured to each said seat supporting legs through a gearing assembly whereby each of said skis may be individually turned by its respective lever to effect steering of said arrangement.

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5 Claims, 3 Drawing Figures

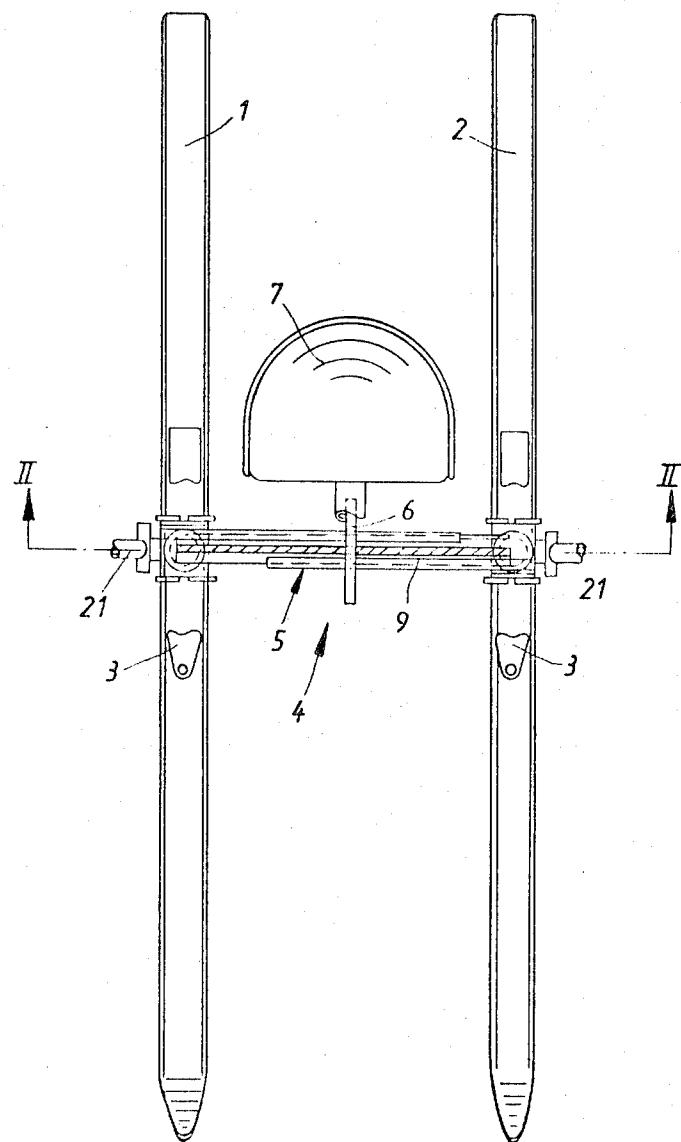


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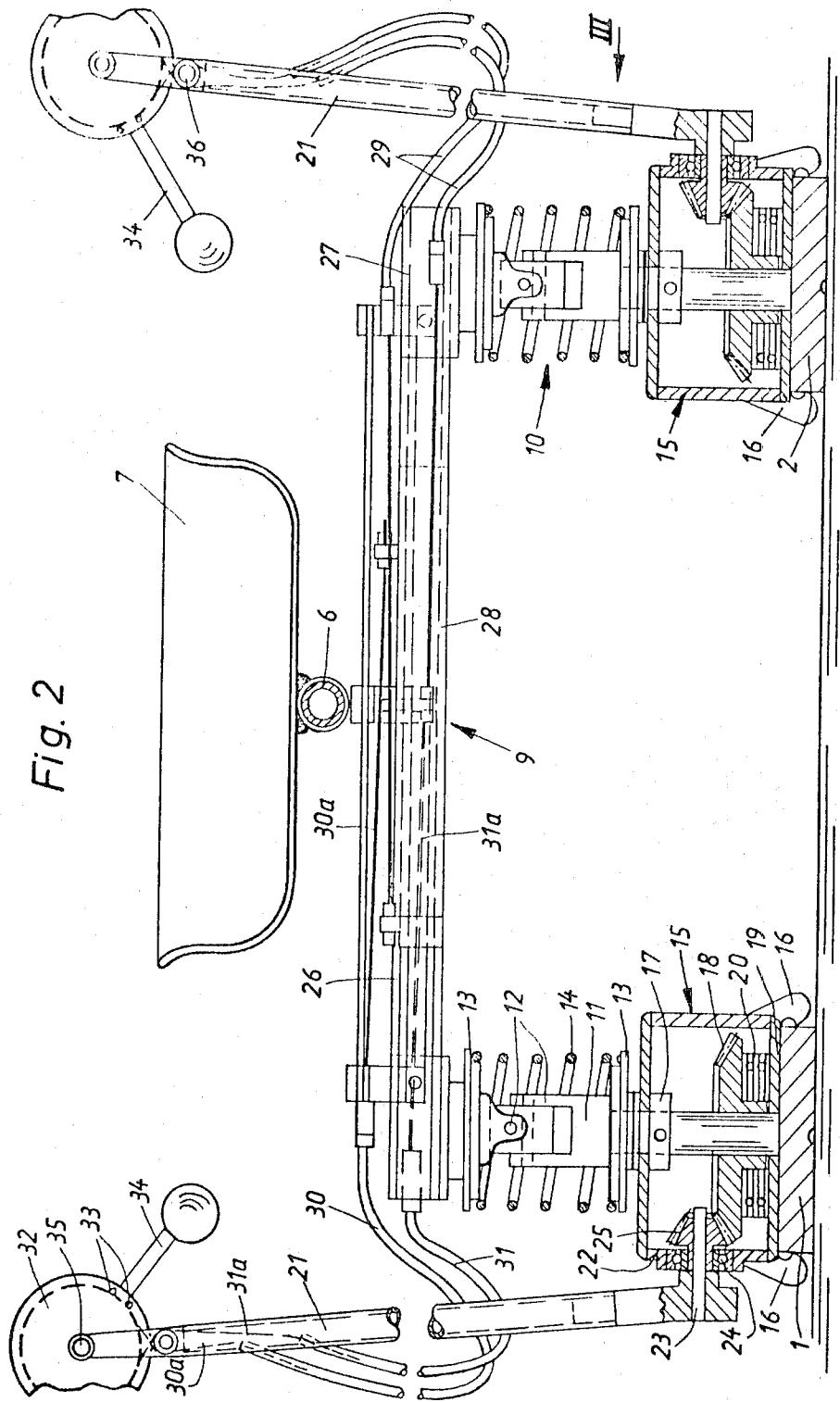
Fig. 1



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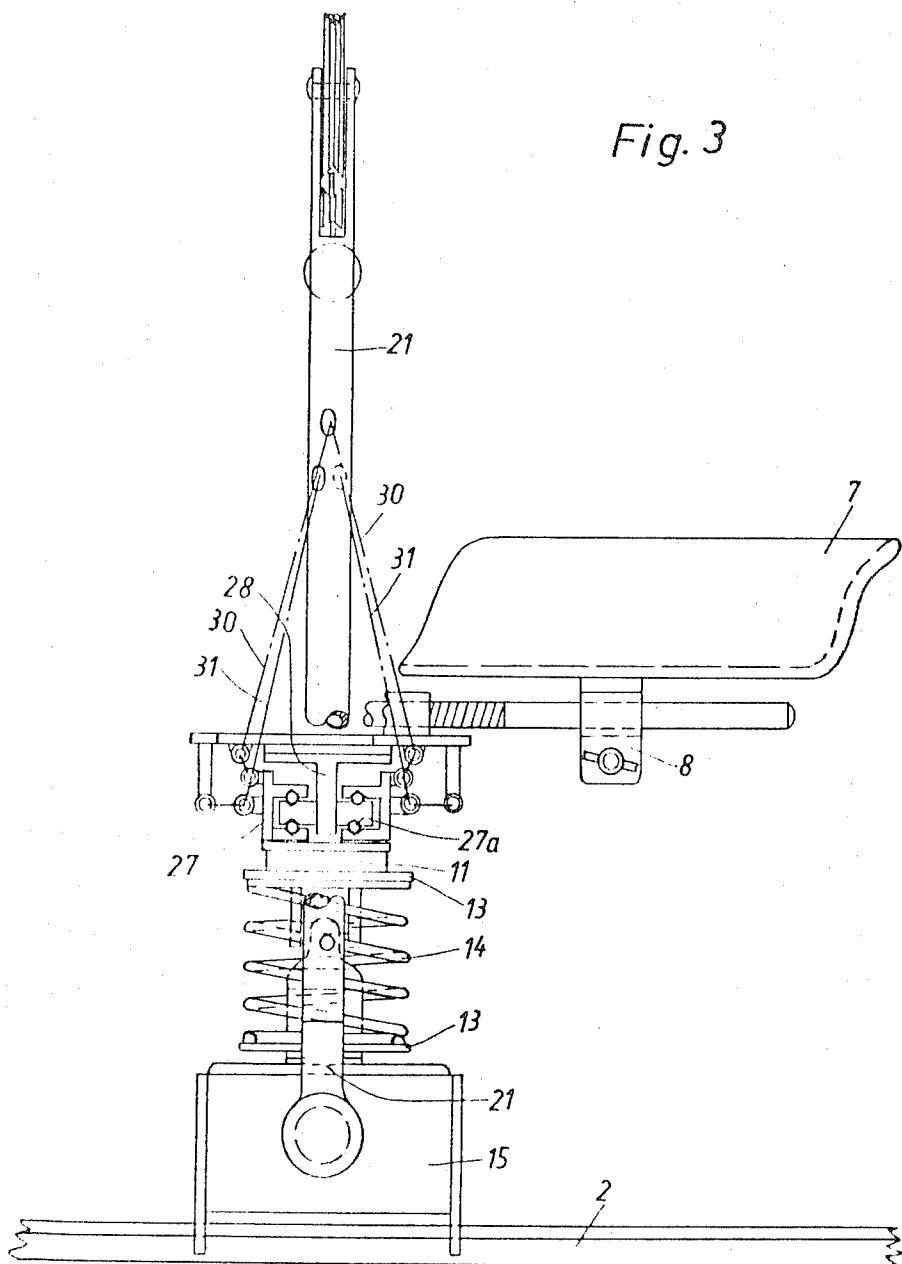


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Fig. 3



ARRANGEMENT FOR SLEDDING BY MEANS OF SKIS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to an arrangement for sledding by means of skis, comprising a channel-shaped supporting assembly having a central support member supporting a spring-suspended seat and wherein each leg of the channel-shaped assembly may be attached at free ends thereof to a ski in detachable manner by means of a steering mechanism operated by the sledder. The steering mechanism includes a pivoting lever movable in longitudinal and transverse directions of the ski for independent turning of the ski approximately about the longitudinal axis of the legs of the channel-shaped assembly and/or tilting or pivoting about the longitudinal axis of the ski.

2. Description of the Prior Art

Ordinary sleds are not conveniently used on downhill skiing runs for various reasons, in particular, because the relatively narrow runners may tear up or destroy the runways. For sledding on ski runs a sled, among other things, must be taken along for the following reasons. After customary skiing on level ground or long downhill runs, many a skier desires to sled, since sledding is less exerting as one merely sits on runners or runner-like devices to slide into the valley. A toboggan will be seldom available to him for such a purpose since, generally, it cannot be taken along because of its inconveniently large size and also because it can be rented only in few skiing areas.

Accordingly, sledding devices comprising skis or runners to be attached to a foot have already been proposed at an early date (German Pat. No. 181,700). In previously known devices the sledder sits on a channel-shaped rigid supporting structure of which the two legs thereof can be attached at the free end in detachable manner to the skis. The support legs are provided with a spherical head at the upper and lower ends thereof. These spherical heads extend into mating ball sockets that simultaneously permit a limited inclination of the skis in the longitudinal and transverse directions. The skis are steered exclusively with the feet that engage in the area of the ski tip by means of a binding. Such a steering with the legs is very exerting.

Accordingly, an improved similar device for sledding by means of skis was later proposed in which a spring-suspended seat is arranged on the central support of an arched supporting frame and with each of the two legs of the supporting frame attached at the free end in detachable manner to a ski by means of a steering device operated by the sledder, the steering device having a pivoting lever movable in the longitudinal and transverse directions of the ski for independent turning of the ski about an axis perpendicular to the central surface of the ski or approximately about the longitudinal axis of the prop and/or for tilting about the longitudinal axis of the ski. For the mobility of the ski in relation to the lower end of the seat support legs and for advantageous steerability of such a device for sledding by means of skis, which requires not only the capability of tilting the ski but also the capability of inclining the ski in relation to an axis perpendicular to the plane of the ski, the pivoting levers are firmly attached to the skis and the ski is pivotable in relation to the seat support legs about two mutually perpendicular axes, of which

one extends parallel with the longitudinal direction of the runners and the other stands upright transversely in relation thereto. For supporting one's legs, the front parts of the skis are provided with foot supports into which ski boots are inserted. A precise steering of the two skis is practically impossible, since excessively large forces are to be applied by the sledder at an unfavorable angle. However, precise steering is necessary if high speed of running is to be attained. Free rotation of the ski approximately about the longitudinal axis of the seat supporting legs is required for this purpose.

SUMMARY OF THE INVENTION

This invention is based on the task of improving the above-mentioned arrangement for sledding by means of skis in such a manner as to provide precise steering and a high speed of running.

To solve the problem in the above-mentioned device the present invention requires that each steering device includes a miter gearing assembly of which a pinion rotated in the gear box can be turned by means of the pivoting lever movable in the longitudinal direction of the ski and of which a bevel gear meshing with the pinion is secured against rotation on the lower half of a universal coupling provided on the lower end of the seat supporting leg, which universal coupling is surrounded by compression springs seated on plates on both sides of the universal coupling. Each universal joint is biased by the springs into an extended condition in which the operative shaft-ends are approximately coaxial.

Since the movement of the pivoting lever acting on the ski is geared down by the miter gearing assembly, the ski can be pivoted or turned without requiring a large action of force approximately about the longitudinal axis of the seat supporting legs into a snowplow position, as the adjustment force is to be applied in the direction of running and the maximum force can be produced in such a direction. However, at the same time, the ski may be put into proper position with respect to snow or tilted about the inner edge without gearing-down required for this, so that the skis can also assume the customary skiing positions. Because of this and the fact that the universal coupling is set in advance in an extended straight-ahead condition above the miter gearing assembly, easy and precise steering is possible, which is required for attaining higher speeds of running in a safe manner. The universal coupling in connection with the miter gearing assembly provides an increased elastic mobility of the ski in relation to the supporting structure and the seat in all directions, even in the vertical direction, which is required, e.g. on bumpy runways, since the ski performs sudden strong vertical movements. A miter gearing assembly thus provides an advantage in comparison with a pin engaging a guide slot and pivotable by means of a pivoting lever. The bevel gear is attached, preferably with interposition of a spring cushioning element, on the ski or on a gear box attachable to the ski. This cushioning element relieves the gearing of considerable shock since the runway impacts acting on the gearing are softened. Accordingly, it is also expedient in accordance with a further development of the invention, if the pivoting lever engages hinge element for the turning of the ski, i.e., the pinion, by way of a spring element.

The ratio of about 2.5 : 1 has turned out as particularly advantageous gearing down from the pinion to the bevel gear.

Also the central support member of the supporting assembly should be spring-cushioned in relation to each ski. This is effected through an elastic structure of the central support member as such or of the support legs as such or by means of springs built into the support legs. The seat is preferably attached in known manner on a supporting arm projecting in the longitudinal direction, which arm is suitably made flexible, in particular consisting of coil or a leaf spring. The sledder thus exerts pressure behind the hinge of the pivoting levers and the levers are thus situated somewhat in front of him, which facilitates the operation thereof. Further suitable spring travel or stroke is provided for the seat in simple manner so that hard impacts cannot be transmitted to the vertebral column of the sledder.

Altogether, the supporting structure should be attached to each ski in flexibly yielding manner, but fixed in regard to a central position. Namely, it is noted that a rigid connection or a practically rigid connection between supporting assembly and ski is not required for straight-ahead running or track holding; on the contrary, freedom of a slight pivoting or deflection with automatic return into a central position is particularly favorable. The sledding arrangement of the invention can be constructed very simply and of light weight, even if further developments thereof are taken into consideration, so that in a folded condition, it can be readily carried along in a rucksack and/or stowed in a car or the like without difficulty, in contrast to customary sleds or even bobsleds that possess ski-like, steerable runners, which if taken along must be towed. There are known skibobs wherein ski sections are pivotable in horizontal plane by means of gearing. The employment of miter gearing for steeringwheel steering devices of bobsleds is also known.

BRIEF DESCRIPTION OF THE DRAWING

The invention and advantageous details thereof are explained more in detail in reference to an exemplified embodiment which is illustrated very schematically in the drawings.

FIG. 1 shows a top view of a pair of skis comprising the mounted sledding device of the invention;

FIG. 2 shows a cross-section through the device along the line II-II of FIG. 1; and

FIG. 3 shows a side elevation, partly in section, in the direction of the arrow III of FIG. 2.

In the top view of FIG. 1, there is a left ski 1 and, at a distance therefrom and in parallel relation thereto, a right ski 2, each provided with a binding 3. A sledding device or down-hill run device 4 of the invention is attached at the center of the ski. Basically, it consists of a central channel-shaped supporting assembly 5 and a seat 7 attached on the rear side by means of a projecting supporting arm 6. Its position can be varied by means of a clamping holder 8 (see FIG. 3). Supporting arm 6 is preferably made yielding or springy; in particular, it consists of a coil or a leaf spring.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Supporting assembly 5 is generally in the shape of an inverted U. A central support member 9 thereof carries supporting arm 6 with seat 7, a seat supporting leg 10 extending downwardly from each of its two ends. Each free end of legs 10 can be connected in detachable

manner to a ski 1 or 2 by means of a steering device operated by the sledder. Legs 10 consist of a two-part strut 11 comprising a universal coupling 12 mounted at the lower end. At the two ends of universal coupling 12, plates 13 are attached to the strut 11 with a compression spring 14 being held between the two plates. While the upper end of strut 11 is attached to the end of central support member 9, the strut 11 is rotatably mounted below in a gear box 15. The gear box 15 can be attached in detachable manner to ski sides by means of clamping levers 16 indicated schematically. Clamping jaws or grip holders may also be provided in this position. The ski can also be arranged to receive a rest implement. A number of holding or clamping devices are available to experts, which does not require a closer explanation.

The lower end of strut 11 rests with a flange or collar on the upper side of gear box 15 and is secured by a sleeve 17 against pulling out. A bevel gear 18 is securely attached against rotation to the lower end of strut 11; the gear can be turned in relation to a plate 19 of the gear box by means of a thrust bearing 20. The gear box 15 can thus undergo angular movements about support leg 10 or strut 11. Such angular movements are necessary so that each ski 1 or 2 can be pivoted about the longitudinal axis of support leg 10, which is necessary during the passage through curves or in snowplow descent. The pivoting movement is brought about through a pivoting lever 21 movable in the longitudinal direction of ski 1 or 2. The lever is pivotably mounted in a side wall 22 of gear box 15, by means of a pivot shaft 23 in a bearing 24 (see FIG. 2). A bevel pinion 25 is secured on the end of pivot 23 and meshes with bevel gear 18. When pivoting lever 21 is pivoted, e.g. in the forward direction, the gear box is turned forward and inward as bevel pinion 25 rolls on bevel gear 18 rotatably connected to supporting assembly 5 by means of support leg 10. The pivoting levers 21 extend so high as to be comfortably grasped at their upper end by the sledder or former skier. He can thus readily bring each ski into a desired position independently of the other ski. On the other hand, the arrangement provides him with a hold for balance and support. The gear box can be set in advance in a straight-ahead position (as illustrated in FIG. 1) by means of a spring which is not illustrated and which engages strut 11 from the gear box, so that the ski can be pivoted or turned only against a spring force. However, the ski can also be tilted through the pivoting lever by means of universal coupling 12 built into strut 11. For this purpose, the pivoting lever need only be pressed inward or outward.

In order to be able to vary the track width, i.e., the distance between skis 1 and 2, also during running, e.g. for increasing it to a snowplow run, central support member 9 of supporting assembly 5 consists of three telescoping supports 26, 27 and 28. Seat 7 is attached to central support 28. Side supports 26 and 27 can be displaced along central support 28 on track and ball means 27a. Bowden cable pairs 29 are provided for telescoping supports 26, 28 or 27, 28 of central support 9. Bowden cable pairs 29 are employed for shifting external supports 26 and 27 in relation to central support 28. Bowden cables 30 and 31 of the pairs are associated with a direction of movement in each case, in such a manner that Bowden cable cores 30a, 31a, leading in opposition to a rotary disk 32 supported on the handle

of the pivoting lever, are attached to pins 33 on the two sides of handle 34, with which the rotary disk can be turned about its support 35 at the outer end of pivoting lever 21. Handle 34 projects radially from rotary disk 32. In place of rotary disk 32, one could also employ a rotary handle such as employed on motorcycles for choke actuation. In each case, the jacket of the Bowden cable is attached in known manner to one and the core to the other of two supports 26 and 28 or 27 and 29 to be moved in relation to each other. The employment of Bowden cable pairs makes it possible to extend or shorten central support 9, in each case by pulling-in the corresponding core. Since the end of the pivoting lever is also provided with handle 34 for track-width adjustment, it is employed simultaneously as means for pivoting the pivoting lever in longitudinal direction and transversely in relation thereto for tilting the ski. In this manner, all adjustment functions can be performed by means of operating or actuating handle 34, which facilitates substantially the handling of the device of the invention.

Although a bucket seat 7 is shown in the drawings, a combination of bucket and bicycle seat may be preferred in certain cases; it provides a particularly effective hold.

The illustrated device for track-width adjustment is not absolutely necessary for a satisfactory operation of the ski-sledding device of the invention. On the contrary, it may be omitted if the supporting structure possesses a sufficient width of 50-60 c.m. In such a case, a particularly robust and simple structure is obtained, since central support member 9 consists of a single piece and no rotary handle or the like is to be provided at the end of each pivoting lever 21. Each pivoting lever can be attached in detachable manner to a pivot extension provided on bevel pinion 25, so that it can be removed for transporting. If such an extension consists of a tube, an inserted ski pole may also be employed as pivoting lever 21.

It is to be understood that while one preferred embodiment of the present invention has been illustrated and described herein, numerous variations or modifications therein may occur to those having skill in this art and what is intended to be covered herein is not only

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the illustrated form of the invention, but also any and all modified forms thereof as may come within the spirit of said invention.

What is claimed is:

- 5 1. A device for sledding by means of skis comprising a channel-shaped supporting assembly having a central support member, a seat member suspended thereon by spring carrying means, said support member including a pair of legs, with free ends of said legs each being attached to one of a pair of skis in detachable manner by means of a steering mechanism operated by the sledger, said steering mechanism including a pivoting lever movable in both longitudinal and transverse directions of the ski associated therewith for independent turning 10 of the ski approximately about the longitudinal axis of the leg of said support member and/or tilting about the longitudinal axis of the ski, characterized in that each steering mechanism comprises a miter gear assembly having a pinion pivotably mounted in a gear box and 15 connected to said pivoting lever and which can be turned thereby as said pivoting lever is moved in a longitudinal direction of a ski, a bevel gear meshing with the pinion, a universal coupling provided on the lower end of each of said legs, said bevel gear being secured 20 against rotation on the lower half of said universal coupling, which universal coupling is surrounded by compression springs resting on plates mounted on opposite sides of the universal coupling to yieldingly impart stability thereto, whereby movement of said pivoting lever 25 may impart turning and/or tilting motion to said ski.
2. A device as in claim 1, characterized in that said pivoting lever engages said pinion for the purpose of turning the ski through a spring element.
3. A device as in claim 1 further characterized in that 30 said seat is attached in known manner on a supporting arm projecting in longitudinal direction of the skis.
4. A device as in claim 3, characterized in that said supporting arm is made springy in known manner, in particular, it consists of a leaf spring.
5. A device as in claim 1 further characterized in that 35 said supporting assembly is disposed in a position between said skis and attached to each ski yielding springy manner.

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