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SKI TRAINING AND EXERCISING DEVICE

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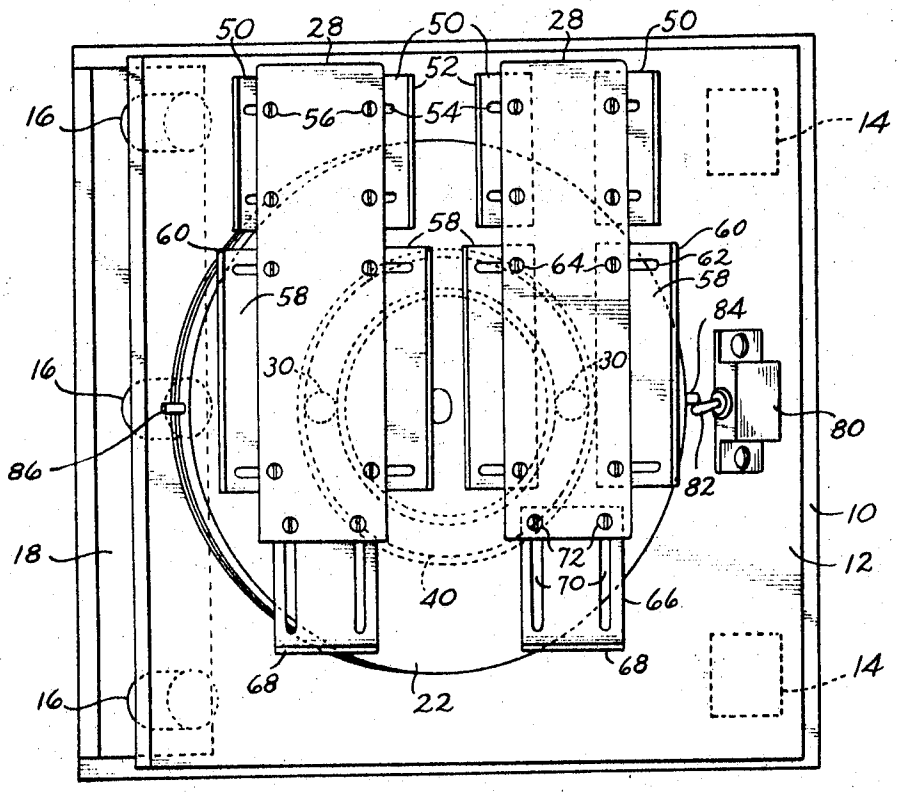


Fig. 1.

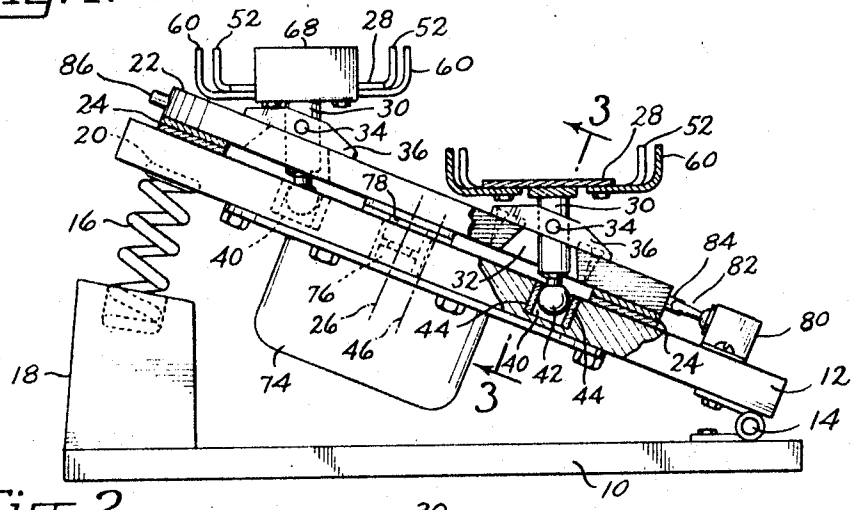


Fig. 2.

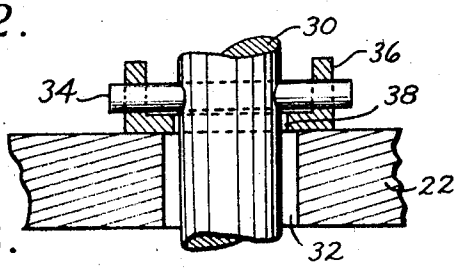


Fig. 3.

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SKI TRAINING AND EXERCISING DEVICE

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ABSTRACT OF THE DISCLOSURE

A turntable is mounted for rotation on an inclined support plate hinged at its lower end to a base plate and supported at its upper end by coil springs interposed between the base and support plates. The turntable may be rotated by an electric motor. A pair of foot supports are supported above the turntable by rods secured pivotally to the turntable, and the lower ends of the rods extend through the turntable and engage a circular guide track on the support plate. The center of the track is offset from the center of the turntable in the downward direction of the inclined support plate such that the foot supports are horizontal when the rod pivots extend transversely of the support plate.

Background of the invention

This invention relates to ski training and exercising devices, and more particularly to a device of the class described which functions to simulate the motions and conditions incident to making parallel turns.

Devices of the class described have been provided heretofore. However, they are characterized by certain deficiencies, principal among which are their complex and costly construction and their inability to simulate exactly the conditions incident to making actual parallel turns on a ski slope.

Summary of the invention

In its basic concept the device of the present invention utilizes a pair of foot supports mounted pivotally on a turntable and guided during rotation of the latter to simulate exactly the parallel positions of the skis during all phases of a parallel turn. As a consequence, all of the parts of the body are caused to be moved sequentially in proper directions exactly as they should under actual skiing conditions.

It is by virtue of the foregoing that the principal objective of the present invention is achieved, namely to overcome the deficiencies of prior devices as set forth hereinbefore.

Another important object of the present invention is the provision of a device of the class described which may be manipulated manually, as a means of exercise, or may be power driven at variable speeds for studying and mastering the various positions and balance of the body during the maneuvers of making parallel turns.

A further important object of this invention is the provision of a device of the class described which is adjustable to accommodate use by persons of varying size and weight.

The foregoing and other objects and advantages of this invention will appear from the following detailed description, taken in connection with the accompanying drawing of the preferred embodiment.

Brief description of the drawing

FIG. 1 is a plan view of a ski training and exercising device embodying the features of the present invention.

FIG. 2 is a view in side elevation of the device illustrated in FIG. 1, parts being broken away to disclose details of internal construction.

FIG. 3 is a fragmentary sectional view taken on the line 3—3 in FIG. 2.

Description of the preferred embodiment

A base plate **10**, adapted to be rested upon the floor or ground in a substantially horizontal position, supports a turntable support plate **12** in an inclined position. The lower end of the support plate is secured pivotally to the base plate by such means as the hinges **14**. The upper end of the support plate preferably is supported resiliently from the base plate. This is achieved, in the embodiment illustrated, by at least one and preferably a plurality of coil springs **16**. Each of the three transversely spaced coil springs illustrated is supported at its lower end in a socket member **18** projecting upward from the base plate and at its upper end in a recess **20** in the underside of the support plate.

A turntable **22** is supported by and substantially parallel to the support plate, by means of the large annular bearing **24** which secures the turntable to the support plate for rotation on an axis **26** which extends substantially perpendicular to the plane of the support plate.

Each of a pair of foot support plates **28** is provided with a supporting rod **30** which extends downward therefrom, substantially perpendicular to the plane thereof. The rods extend freely through slots **32** in the turntable. The slots are elongated in the diametrical direction of the turntable and are located on opposite sides of the rotational axis **26** of the turntable. Each of the rods is secured pivotally to the turntable intermediate its ends by means of the pivot pin **34** which is anchored at its opposite ends in the U-shaped bracket **36**. Each bracket spans the associated slot in the turntable and is secured to the latter by such means as screws. An elongated slot **38** in the bracket registers with the slot **32** in the turntable and receives the rod therethrough. The axis of the pivotpin **34** extends substantially parallel to the plane of the turntable.

Guide means is provided for guiding the support rods during rotation of the turntable. In the embodiment illustrated the guide means comprises a circular groove **40** in the support plate. The lower ends of the support rods are formed or otherwise provided with spherical heads **42** which are received slidably in the groove and are retained therein during rotation of the turntable. The side surfaces of the groove preferably are lined with strips **44** of Teflon or other suitable material having a low coefficient of friction, to minimize the resistance to motion of the heads **42**.

In the making of a parallel turn it is important that the skis be maintained parallel to each other during the entire turn and that they be edged into the hill during the traverse portion of the turn, i.e., across the slope. These conditions are provided in the device of the present invention by making the operative diameter of the groove **40** equal to the distance between the axes of the support rod pivot pins **34**, and offsetting the center **46** of the guide groove from the center **26** of rotation of the turntable an appropriate distance in the downward direction of the inclined support plate. As illustrated in FIG. 2 the support rods thus are positioned in vertical planes and the foot support members are disposed in horizontal planes with their longitudinal axes extending transversely of the support plate.

Each of the foot support plates **28** is provided with a pair of laterally spaced heel plates **50** having upturned marginal portions **52** for confining a shoe heel therebetween. The heel plates are provided with laterally elongated slots **54** which receive the securing bolts **56** extending through openings in the plate **28**. The heel plates thus are adjustable laterally to accommodate heels of varying width.

Also provided are a pair of soleplates **58** having simi-

larly upturned margins 60 and laterally elongated slots 62 receiving the securing bolts 64 in the plate 28, for adjustment to shoe soles of varying width.

An adjustable shoe tip plate 66 also is provided with an upturned front end 68 and a pair of laterally spaced, longitudinally elongated slots 70 receiving securing bolts 72 in the plate 28. This tip plate thus is adjustable in the longitudinal direction of the plate 28, and serves to position shoes of varying length preferably such that the ball of the foot is located over the support rod 30.

The shoe or ski boot may be secured to the foot support assembly by thongs or straps, as will be understood.

In the alternative the foot support members may comprise the central portions of a pair of skis, including safety or other conventional forms of bindings. The ski portion may be secured to the plate 28 by means of screws extending through the openings for the bolts 56, 64 and 72.

The device described hereinbefore may be manipulated manually by the person standing on the foot supports. It is desirable to place the device in an open doorway, with the axis of hinges 14 parallel to the plane of the door opening, to provide the user with available supports for recovering balance, if necessary, and also to orient the user to a direction simulating the downhill direction of a slope.

In the position of the components illustrated in FIG. 1 of the drawing the person standing on the foot supports has his feet pointing to the bottom of the drawing and the upper portion of his body facing to the right, in the downhill direction, simulating a traverse to the right. The knees are held together and bent so the body assumes the well known "comma" position for skiing. The person then performs a down-up-down knee bending motion, shifting the majority of body weight from the downhill to the uphill foot support, and simultaneously twists the lower portion of his body in a counterclockwise direction (FIG. 1), to initiate counterclockwise rotation of the turntable. The shoulders should be maintained parallel to the plane of the doorway.

The foot supports rotate with the turntable, but are maintained parallel to each other by virtue of the pivot pins 34 fixed to the turntable. The foot supports thus rotate counterclockwise first through the downhill position in which they are disposed in a common inclined plane parallel to the inclined plane of the turntable, and thence to a position substantially 180° from the position illustrated in FIG. 1. In this position the device simulates a traverse to the left. This procedure is repeated, but in the reverse direction, to progress from the left hand traverse through the downhill position to a right hand traverse, to return the components of the device back to the position illustrated in the drawing.

During the foregoing operation the various parts of the body are forced to move sequentially through the precise positions of balance necessary to execute the parallel turns, exactly as would be experienced on the ski slope. Thus, the device functions to train the novice skier in the technique of parallel turns by causing the body to move through the appropriate positions for executing the parallel turns correctly. The device also serves the accomplisher skier as an exerciser for developing and maintaining muscle tone and coordination.

Although the turntable support plate may be supported in a fixed inclined position relative to the base plate, the resilient support illustrated is preferred, since it simulates for the user the resilience of the skis traveling over snow. The three springs 18 illustrated are suitable for use by heavy persons. For lighter persons the two endsprings may be employed, with the middle spring removed. For still lighter persons the central spring may be used, with the end springs removed.

If desired, particularly when the device is used for training novices, the turntable may be power driven. To this end there is illustrated in the drawing a variable speed, reversible, electric motor and gear reduction unit 74 secured to the underside of the support plate. The outer shaft 76 of the unit extends through an opening in the plate and is coupled to the stub shaft 78 secured to the underside of the turntable on the axis 26 of rotation of the latter. The electric circuit of the drive motor includes the electric switch 80 mounted on the support plate. The toggle 82 for the switch projects toward the turntable for selective engagement by the lugs 84, 86 which project from the periphery of the turntable at substantially diametrically opposite points.

In the position illustrated in FIG. 1 the lug 84 has just engaged the switch toggle, by clockwise rotation of the turntable, thereby operating the switch to reverse the direction of rotation of the drive motor to rotate the turntable in the counterclockwise direction. After substantially 180° counterclockwise rotation of the turntable, during which the person standing on the foot members has been moved through a simulated parallel turn from a right hand traverse through the downhill position to a left hand traverse, the switch is actuated by the lug 86 to again reverse the direction of the drive motor to effect clockwise rotation of the turntable.

If it is desired to provide the user with control of the electric drive motor, the electric circuit of the latter may also include a pair of switches connected in parallel and mounted one in each of a pair of ski pole handles for manipulation by the thumbs.

From the foregoing it will be appreciated that the present invention provides a simplified and inexpensive device which simulates exactly the sequence of movements necessary to execute parallel ski turns. The device thus may be employed for the training of novices and for the practicing and exercising of skilled skiers. For the training of novice skiers the device may be power driven to rotate the turntable slowly to allow the novice to study the body movements necessary to perfect the turn. For practice and exercise it is preferred that the device be manipulated manually by the user.

It will be apparent to those skilled in the art that various changes in the size, shape and arrangement of parts described hereinbefore may be made without departing from the spirit of this invention and the scope of the appended claims.

Having now described my invention and the manner in which it may be used, I claim:

1. A ski training and exercising device comprising
   (a) a turntable support member,
   (b) base means supporting the turntable support member at an angle inclined with respective to horizontal,
   (c) a turntable member,
   (d) pivot means mounting the turntable member on the support member for rotation on an axis substantially perpendicular to the plane of the support member,
   (e) a pair of foot support members positioned above the turntable member,
   (f) a support rod on each foot support member,
   (g) the support rods extending downward from the foot support members freely through openings in the turntable member located on opposite sides of the rotational axis of the turntable member,
   (h) pivot means mounting the support rods on the turntable member for pivoting the support rods on spaced axes substantially parallel to each other and to the plane of rotation of the turntable member, and
   (i) support rod guides means on the turntable support member slidably engaging the lower ends of the support rods whereby the foot support members will be maintained parallel to each other during a turn and will be edged into the incline during the traverse portion of the turn.

2. The device of claim 1 wherein the guide means is substantially circular with its center offset from the rotational axis of the turntable member in the downward direction of the inclined support member.

3. The device of claim 1 wherein the guide means has an operative diameter substantially equal to the distance between the axes of the support rod pivot means.

4. The device of claim 1 wherein the guide means has an operative diameter substantially equal to the distance between the axes of the support rod pivot means, and its center is offset in said downward direction sufficiently that the foot support members are disposed in horizontal planes when the axes of the support rod pivot means extend transversely of the inclined support member.

5. The device of claim 1 wherein the guide means comprises a substantially circular groove in the support member receiving therein the lower ends of the support rods.

6. The device of claim 1 including resilient means between the turntable support member and base means.

7. The device of claim 6 wherein the base means comprises a base plate hinged to the lower end of the support member and the resilient means comprise at least one coil spring interposed between the base plate and support member at the upper end of the latter.

8. The device of claim 1 wherein the turntable mounting pivot means includes a reversible electric motor secured to the support member and having a rotary output shaft connected to the turntable member.

9. The device of claim 8 including

(a) switch means in the electric circuit of the motor, and

(b) switch actuator means,

(c) the switch means and switch actuator means being mounted one on the turntable member and the other on the turntable support member for mutual engagement,

(d) the switch actuator means being operable upon rotation of the turntable member through substantially 180° to actuate the switch means to reverse the direction of said rotation.

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