Nov. 30, 1948. C. A. SCRIVER 2,455,274

SKI TRAINER AND EXERCISER

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FIG. 1.

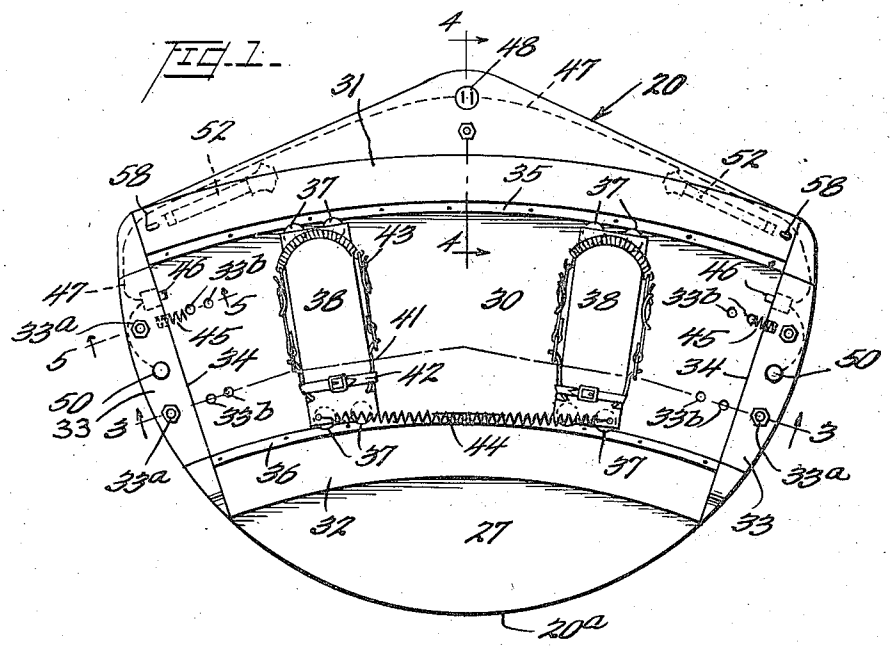


FIG. 2.

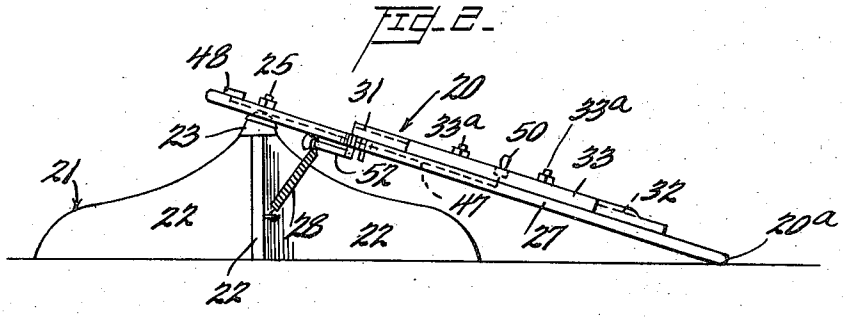
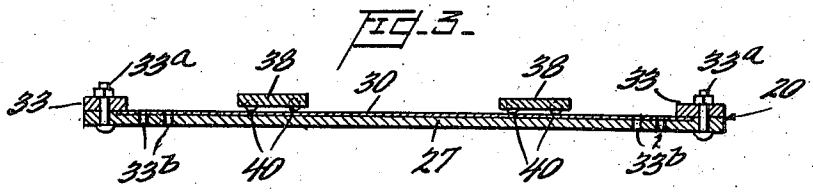


FIG. 3.



Inventor

Clarence A. Scriver,

By Marvin L. Patterson

Attorneys

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SKI TRAINER AND EXERCISER

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FIG. 4.

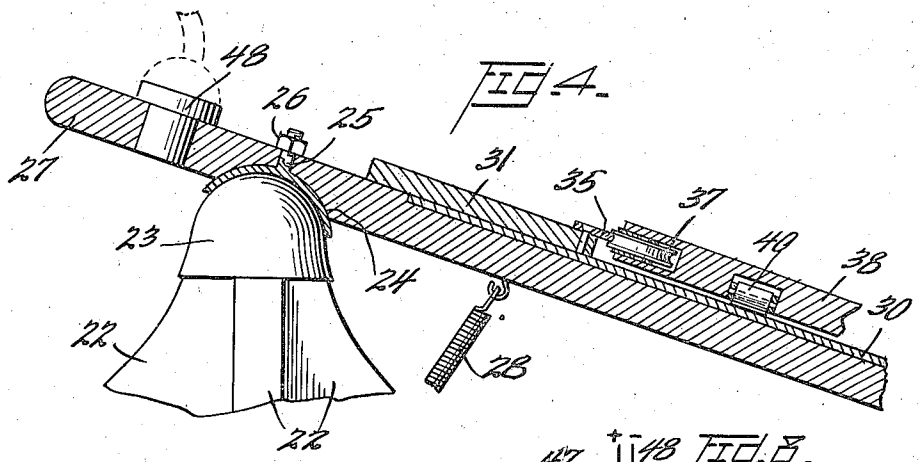


FIG. 5.

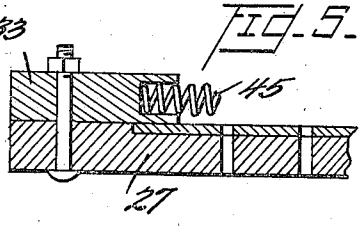


FIG. 8.

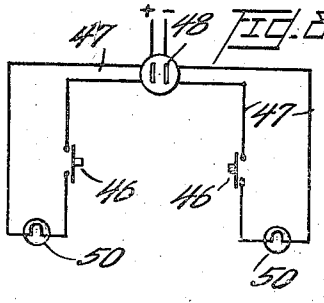


FIG. 6.

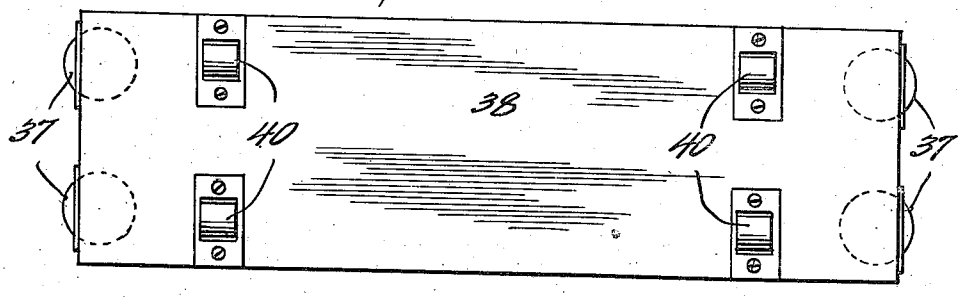
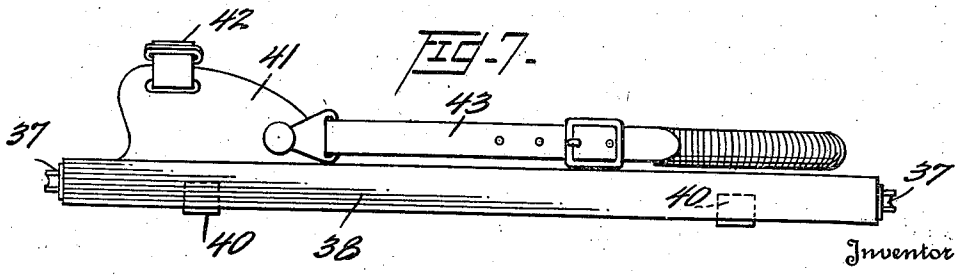


FIG. 7.



Inventor

Clarence A. Scriver,

By Marcus B. Stevenson

Attorneys

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SKI TRAINER AND EXERCISER

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FIG. 9.

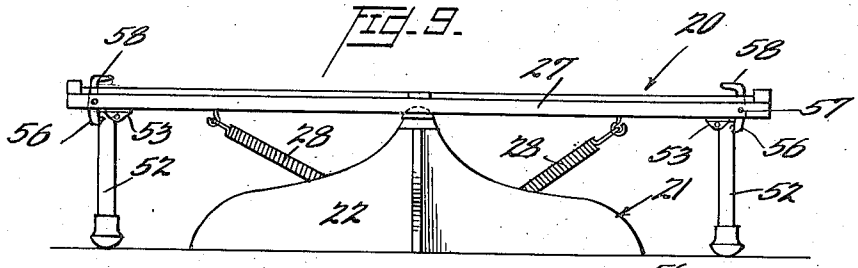


FIG. 10.

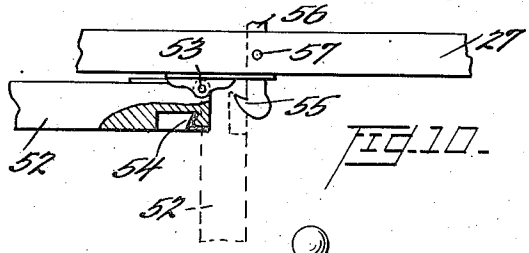


FIG. 11.

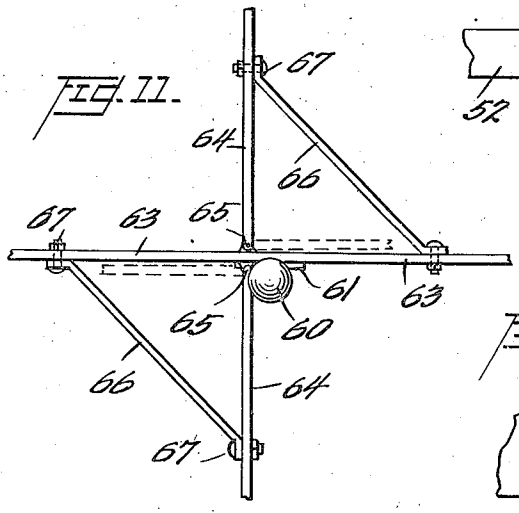


FIG. 12.

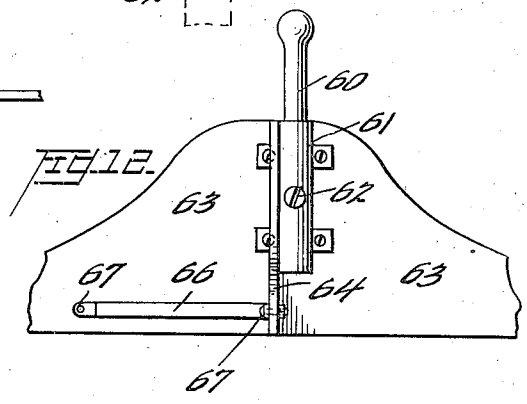
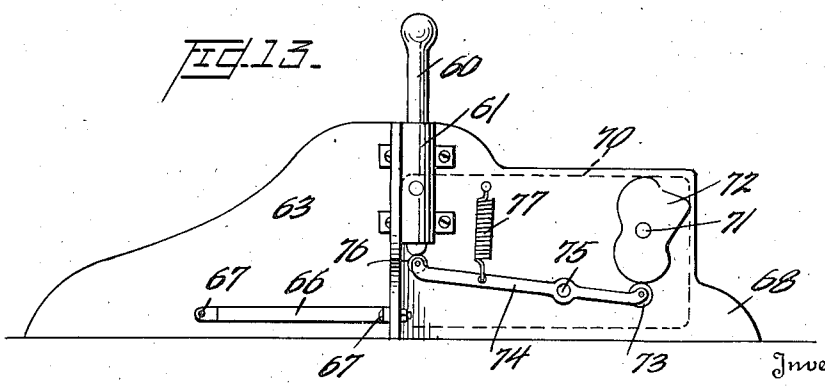


FIG. 13.



Inventor

Clarence A. Scriver,

By Merwin & Pittman

Attorneys

Nov. 30, 1948. C. A. SCRIVER 2,455,274

SKI TRAINER AND EXERCISER

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FIG. 14.

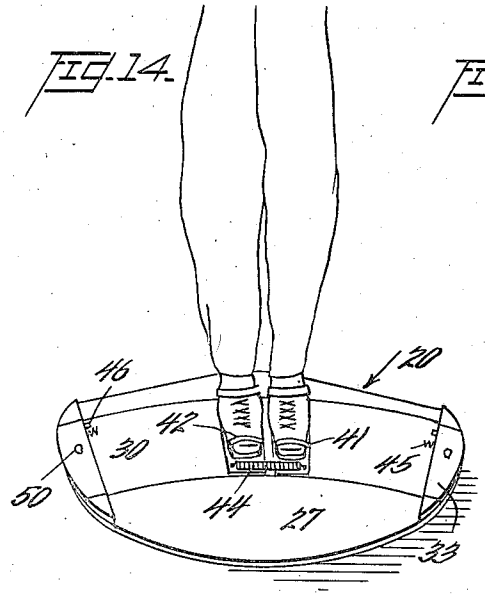


FIG. 15.

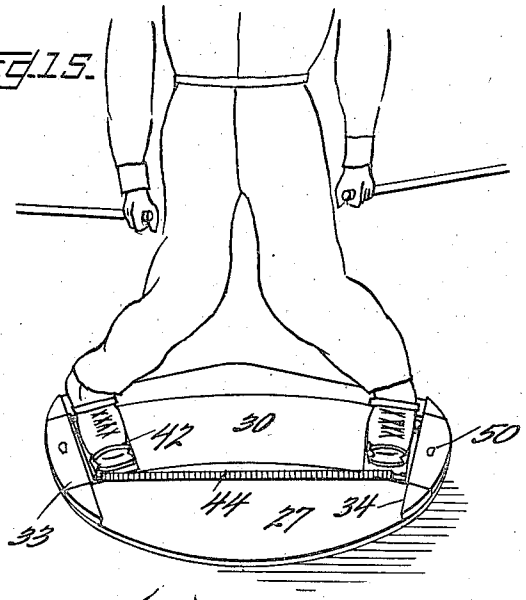


FIG. 16.

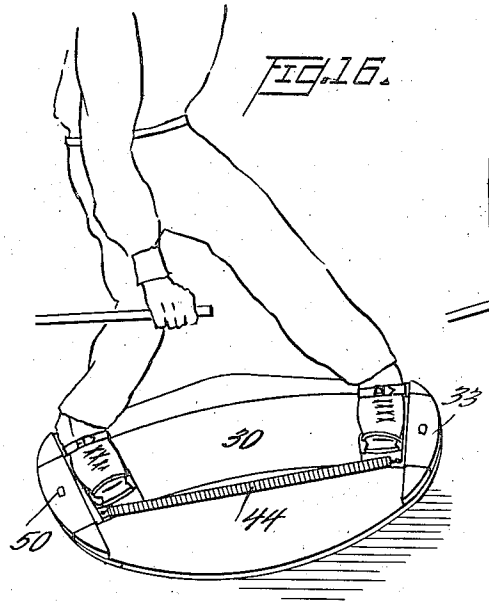
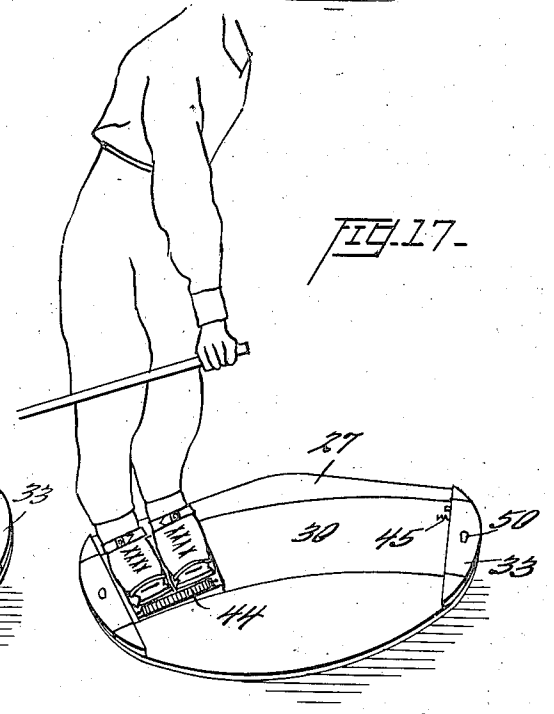


FIG. 17.



Inventor

Clarence A. Scriver,

By Norris & Bateman

Attorneys

Patented Nov. 30, 1948

2,455,274

UNITED STATES PATENT OFFICE

2,455,274

SKI TRAINER AND EXERCISER

Clarence A. Scriver, Glens Falls, N. Y.

Application September 28, 1945, Serial No. 619,210

15 Claims. (Cl. 272—57)

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This invention relates to a machine designed to enable a person to learn the fundamentals of skiing without recourse to actual skis or to a snow covered surface. The machine can be set up and operated on the floor of a room or in the yard or other convenient place.

More particularly, the present invention is concerned with the provision of a machine upon which one can practice, with a highly perfected degree of simulation, stances and maneuvers such as the "snowplow," "snowplow turns," "stem-turns" and "stem-christies."

It is the primary object of my invention to devise a machine of this character, which is useful to the novice in learning how to ski skillfully upon the slopes and also to the expert skier in attaining and maintaining skill and condition when there is no snow available.

It is another major object to provide a machine in which resistances to muscular movements are set up to simulate those resistances encountered in actual practice upon skis; and in this connection it is an important object to equip the machine with means for indicating to its "rider" whether or not his stance and movements are correct.

These and other objects of this invention should clearly appear from the following description when studied in conjunction with the accompanying drawings, wherein:

Fig. 1 is a top plan view of a preferred embodiment of the present invention;

Fig. 2 is a side elevation of the machine of Fig. 1, as viewed from the left;

Fig. 3 represents a cross section taken substantially along the line 3—3, Fig. 1;

Fig. 4 is an enlarged fragmentary section taken on the line 4—4, Fig. 1, with one of the foot plates moved into the plane of intersection;

Fig. 5 is an enlarged fragmentary section taken on line 5—5, Fig. 1;

Fig. 6 is a bottom plan view of one of the foot plate units;

Fig. 7 is a side elevational view of the foot plate unit of Fig. 6;

Fig. 8 is a diagram showing the electrical circuit and devices used in the apparatus;

Fig. 9 is a rear elevational view of the same apparatus, with stabilizing legs set vertically;

Fig. 10 is an enlarged fragment, in partial section, showing the means for latching and manipulating each stabilizing leg;

Fig. 11 is a top plan view of a modified form of pedestal for the table, its feet being partially broken away;

Fig. 12 is an elevation of the device of Fig. 11, as viewed from its lower side;

Fig. 13 is a view similar to Fig. 12, but showing a further modification embodying power mechanism for varying the table slope;

Figs. 14 to 17 are somewhat schematic views designed to illustrate a few of the positions in which the table and its parts may be placed by the legwork and footwork of an operator.

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With continued reference to the drawings, wherein like numerals designate like parts, and with particular reference for the moment to Figs. 1 to 4, and 9, the machine of my invention, as shown in the present instance, consists essentially of a table or platform designated in its entirety by the numeral 20, and a supporting base, in the form of a pedestal or standard and designated as a unit by the numeral 21.

The standard 21 may be of any suitable shape or construction, but preferably comprises four radiating and centrally joined wooden feet 22, each flat in a vertical plane and winglike in form. At their juncture the feet slope upwardly into a peak, as shown, for reception of a tight fitting metal cap 23, which has a spherically curved upper exterior surface complemental to the interior surface of a substantially hemi-spherical shell 24.

The shell 24 has an integral stem 25, threaded for cooperation with a clamping nut 26, which engages a flat platform 27 (preferably of the contour shown in Fig. 1) to hold the shell within a recess in the underside of the platform. A light film of lubricant may be interposed between the members 23 and 24, for, as presently seen, the platform pivots and tilts upon the pedestal during certain ski-practice maneuvers (see Figs. 14 to 17).

A pair of coil springs 28, connected in tension between the platform 27 and the feet 22 of the pedestal, as shown, tend to maintain the table 20 in a "level" position as seen in Figs. 14 and 15, with no lateral tilting. These springs are designed to simulate the resistance of snow to the movements of skis in certain actual outdoor exercises.

Upon the platform 27, preferably recessed therein, is a hard metal sheet 30, designed to form an arcuate track upon which special simulated ski devices are to ride, as presently explained. This track is bounded at its upper and lower edges by a pair of arcuate wooden strips, 31 and 32, attached to the platform 27 in any suitable manner. The distance between these strips corresponds approximately to the length of a ski shoe, and these strips may be made of different sizes for trainers of different sizes. The arcuate curvature of these strips corresponds substantially with a curve that would be executed by a skier using skis of standard length and making an average snowplow or a turn, as will later be discerned.

The strips 31 and 32 have secured thereto, by screws or otherwise, metal guide rails 35 and 36, respectively, of the same arcuate curvature. The rail 35 contacts the grooves of guide wheels 37,

which are rotatably mounted in the "heel" ends of a pair of shoe plates 38. Another set of wheels 37 is rotatably mounted in the "toe" end of each plate 38. These wheels serve only for guidance of the shoe plates 38 along the arc of the rails 35, 36, and for retaining the shoe plates on the platform, the weight of the shoe plates and their supported skier being carried by a set of rollers 40 that are pivotally secured within recesses in the bottoms of the plates so that the latter may ride freely back and forth laterally, upon the metal track 30. The wheels 37 and the rollers 40, of course may be mounted in anti-friction bearings, and lubricated in any conventional manner.

The ends of the track just described are defined by a pair of side-strips 33, secured to the platform 27 in any suitable manner, as by bolts 33a, and having inside surfaces 34 designed to limit the lateral or outward movement of the shoe plates 38. In order to accommodate smaller persons the side strips 33 may be adjustable inwardly between the strips 31 and 32 and secured in different adjusted positions by placing the bolts 33a in the appropriate holes 33b in the platform 27. The radii of the straight surfaces 34 are such that they intersect the center of the arcs of curvature of the rails 35, 36.

Each shoe plate 38—which forms the foot-supported section of a simulated ski—has the usual shoe fastenings comprising side clamps 41, toe straps 42, and a heel-engaging resilient unit 43. It may also embody ankle straps for certain exercises. None of these accouterments forms a part of the present invention. It will be observed that if a person is standing with the usual sport shoes upon the plates 38, with shoes properly secured thereto, that he may assume any natural skiing stance and that he also may shift his feet laterally relative to each other along the track provided by the floor 30 and the guide rails 35, 36.

The shoe plates 38 are interconnected by a tension spring 44, to resist separation of the plates in approximate concordance with the resistance that would be produced by snow in actual skiing upon a slope. Incidentally, an average slope of about 35 degrees is reproduced by the height of the ball 23 and the related dimensions of the tilt-table 20, which at its forward curved edge 20a, rolls upon the floor when turning maneuvers are executed.

A compression spring 45 (see especially Fig. 5) is inset at the inner side of each strip 33 to yieldingly resist movement of its associated shoe plate 38. Upon properly executing the particular maneuver and compressing the spring 45 to the proper extent, a conventional push-button switch 46 is closed to complete an electrical circuit comprising dual wires 47 fed from a conventional socket 48, the latter designed for connection, as by an extension cord and plug to any convenient electrical outlet. Completion of the circuit is accomplished through one or the other of two electric lamps 50, one at each side of the table 27 and exposed to the view of the "rider" so that he may observe the degree of perfection of his foot movement. As previously explained, some of these movements are observable in Figs. 14 to 17.

For the purpose of "levelling" the table 27 to facilitate mounting of the machine by the skiier and to permit the execution of "snowplows" and the like, the table 27 at its underside is equipped with a pair of stabilizing legs 52, pivotally connected thereto by conventional spring hinge assemblies 53, the tendency of which is to throw the legs into folded position against the bottom of the table as seen in Figs. 2 and 10. Against the resistance of the hinges, however, the legs 52 may be forced into vertical position (Fig. 9), and they have latching notches 54 designed to coact with complemental latching hooks 55 for retaining them in vertical or stabilizing position.

The hooks 55 are weighted and integrally joined to a pair of levers 56 that extend downwardly through the table to be pivotally pinned thereto at 57, the upper ends of the levers being bent to form operational elements 58 that may be pushed laterally inwardly to trip and release the latches. Thus, the skiing practicer, after mounting the machine, may utilize the bottom tips of his ski poles to oscillate the elements 58, release the latches and permit the spring hinges to throw the legs 52 into the position of Fig. 10.

Figs. 11 and 12 illustrate a modified form of standard in which the simulated ski slope is variable. A ballheaded pin 60 adapted to receive the socket 24 and to support the table (not shown), is adjustable vertically in a sleeve 61, and is locked in various positions of adjustment by a set screw 62. The sleeve unit 61 is secured to any one or more of the supporting feet 63, 64.

Preferably, the feet 63 are integral and the feet 64 are pivotally connected thereto at 65. A pair of braces 66 are disposed across two of the angles formed by the feet, and attached to the latter by screw assemblies 67. Thus, the assemblies 67 may be detached to permit the braces to be removed and the feet 64 to be swung and folded against the feet 63, for compact storage, as illustrated in broken line in Fig. 11.

For the more experienced skiier, the supporting standard may be mechanized to cause the rear pivoted end of the table to rise and fall to simulate changes in degree of the ski slope. As seen in the modification in Fig. 13, one of the feet, (e. g. a foot 63), is adapted to afford a foot member 68, enlarged to provide a casing 70 for housing an electric motor and speed reduction gearing (conventional and not shown) for slowly rotating a shaft 71 journaled in the casing. The shaft 71 carries, for unitary rotation therewith, a cam 72 having any suitable preselected contour for creating variable ski slopes.

The cam 72 rotates in rolling contact with a roller 73 carried by one end of a lever 74 that is pivoted intermediate its ends at 75 upon a side wall of the casing 70. The other end of the lever 74 carries a roller 76 in rolling contact with the lower end of the ball-headed pin 60 so as to periodically elevate and lower the latter, thus to continuously vary the forward angle of tilt or "slope" of the table or platform assembly 20. A tension spring 77 is interconnected between the lever 74 and a part of the casing 70 thereabove to maintain the roller 76 in constant contact with the lower end of the pin 60.

The manner of utilization of the machine is now believed to be fairly obvious. With further reference to Figs. 14 to 17, it should be understood that in the position of the platform 20 as shown in Fig. 14 the legs 52 are vertical for leveling and stabilizing the platform, as shown in Fig. 9, and that the skier is simulating travel straight down a snow covered hill; and that in Fig. 15 he is executing a "snow-plow" without change in the position of legs 52. In Fig. 16, the skier has started a left-turn snow-plow, which also may be the beginning of a stem turn, completed in Fig. 17. It will be apparent to experienced skiers that these simulated maneuvers may

be reversed and modified to approximate any of the actual maneuvers that can be executed upon skis.

Obviously, many changes may be made in the design and details of the machine without departing from the spirit of the present invention. Therefore, it is to be understood that the scope of the invention is to be determined by a reasonable interpretation of the appended claims.

What is claimed is:

1. A skier's training and exercising machine comprising a table set at an angle to the horizontal to simulate an actual skiing slope, and a track mounted upon said table and extending transversely of the direction of slope thereof to afford a surface for simulated skiing foot movements.

2. In the machine defined in claim 1, said track comprising an arcuate surface and embodying arcuate guide members, and there being a pair of shoe-supporting plates designed to be pushed to and fro over said surface and to coact with said guide members.

3. A skier's training and exercising machine comprising a table tilted to simulate an actual skiing slope, a track mounted upon said table and embodying a curved and transversely arranged guideway, a pair of shoe-supporting plates slidable to and fro over said track within said guideway, and resilient means interconnecting said plates to tend to draw them together.

4. A skier's training and exercising machine comprising a base, a table pivotally mounted upon said base and designed to tilt laterally in both directions, a curved laterally arranged track carried by said table, and a pair of shoe plates slidable along said track.

5. In the machine defined in claim 4, means operable at will to hold said table in untilted position.

6. A skier's training and exercising machine comprising a base, a table pivotally mounted upon said base and designed to tilt laterally in both directions, a curved laterally arranged track carried by said table, and a pair of shoe plates slidable along said track, a pair of legs pivotally attached to the lateral edge portions of the table, means yieldingly urging said legs into horizontal position, and latching means for locking said legs in vertical position to support and stabilize the table, said latching means including devices operable from above the table to permit said legs to collapse against said table.

7. Apparatus of the character described, comprising a supporting base designed to rest upon a level surface, a table pivotally mounted near one edge upon said base to slope downwardly from said edge and designed to have its opposite edge oscillate laterally upon said level surface, a track upon said table and extending laterally of the slope thereof, and stabilizing spring means designed to resist oscillation of the table.

8. Apparatus of the character described, comprising a plurality of substantially flat and vertically arranged legs, said legs embodying pivotal connections and radiating from a common center so that some of them may be swung and folded, means supported by said legs above their center of radiation to provide a pivot, a table tiltably mounted upon said pivot, and a track carried by said table.

9. Apparatus of the class described, comprising a base, a vertically adjustable post carried by said base, a laterally tiltable table pivotally supported adjacent one edge upon the top of said post and having a curved opposite edge providing a rolling support for the table while tilting laterally, and a skier's training assembly mounted upon said table.

10. In the combination defined in claim 9 power operable means for continuously and automatically varying the height of said post and thus varying the angle of slope of said table.

11. A skier's training and exercising machine comprising a supporting unit, affording a pivot, a platform tiltably mounted upon said pivot, an arcuate track carried by said platform, a pair of shoe-supporting plates slidable to and fro upon said track, and stop members secured to said table at the ends of said track to limit the outward movement of said plates.

12. In the machine defined in claim 11 means mounted at the inside edges of said stop members to cushion and yieldingly resist the outward movements of said plates.

13. A skier's training and exercising machine comprising, a supporting base, a table mounted upon said base to simulate a skiing slope, an elongated track carried by said table and arranged transversely to the general direction of downward slope of the table, said table including an electric circuit embodying switches at the ends of said track, a pair of foot-supporting plates slidable along said track, and engageable with said switches to actuate them, and indicating means in said electric circuit and operable by said switches when the latter are engaged by said plates.

14. A machine of the class described, comprising a supporting member, a table slopingly mounted upon said member and carrying an elongated track arranged transverse to the direction of slope, a pair of arcuate guide rails attached at the sides of said track in substantial parallelism, shoe-supporting plates having rollers for mounting them antifrictionally upon said track, said plates having rollers at each end for coaction with said guide rails, and means at each end of said track to afford stops for limiting the movement of said plates.

15. In the combination defined in claim 14, said supporting member and said table having complemental means for tiltably mounting said table for oscillation in the general direction of track elongation, stabilizing springs connected to said table to yieldingly resist tilting thereof, a pair of switches associated with said stops and operable by said plates, and an electric circuit carried by said table and including said switches, said circuit further including a pair of electric lamps arranged for illumination upon actuation of one or the other or both of their associated switches.

CLARENCE A. SCRIVER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,121,438	Whitmore	Dec. 15, 1914
1,521,487	Turner	Dec. 30, 1924
2,274,081	Mautin	Feb. 24, 1942