

Oct. 9, 1962

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3,057,634

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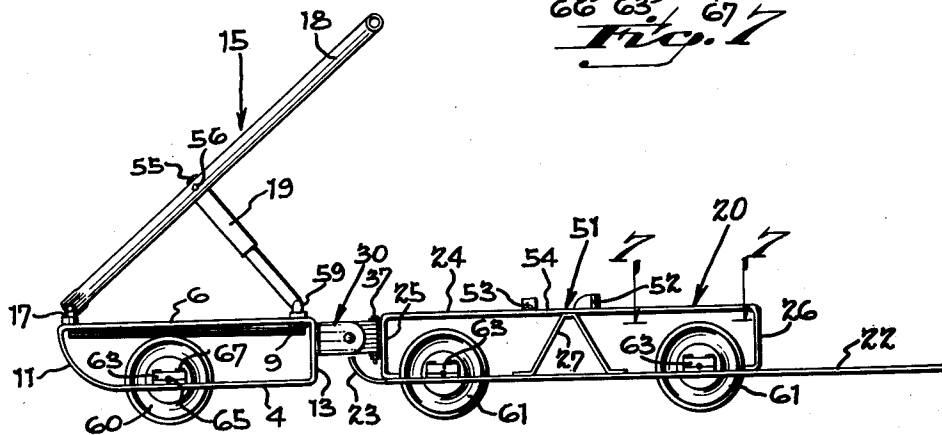
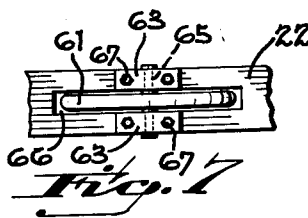
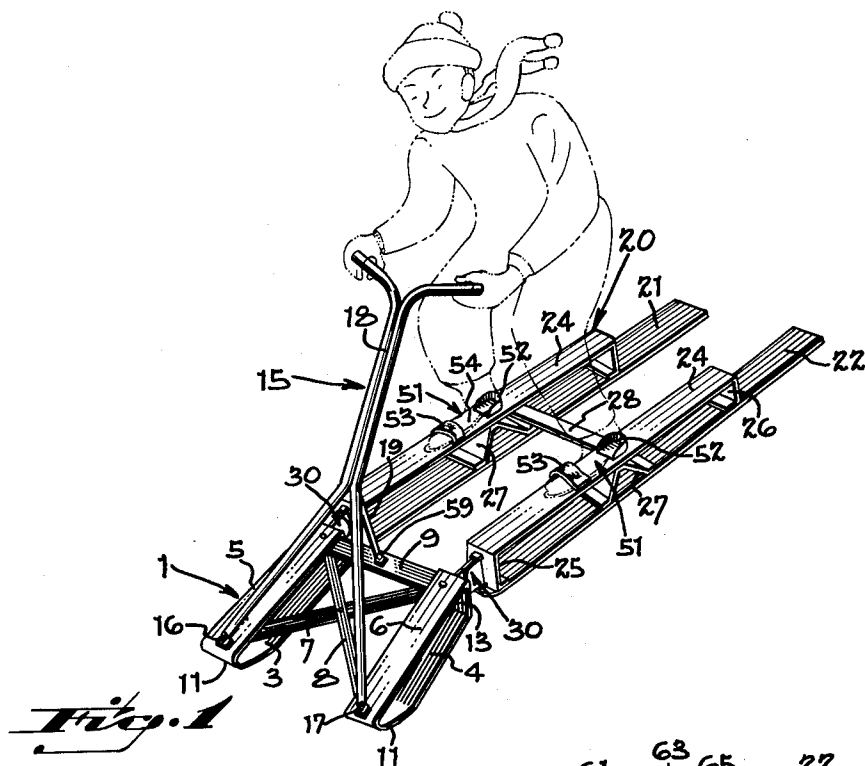


Fig. 6

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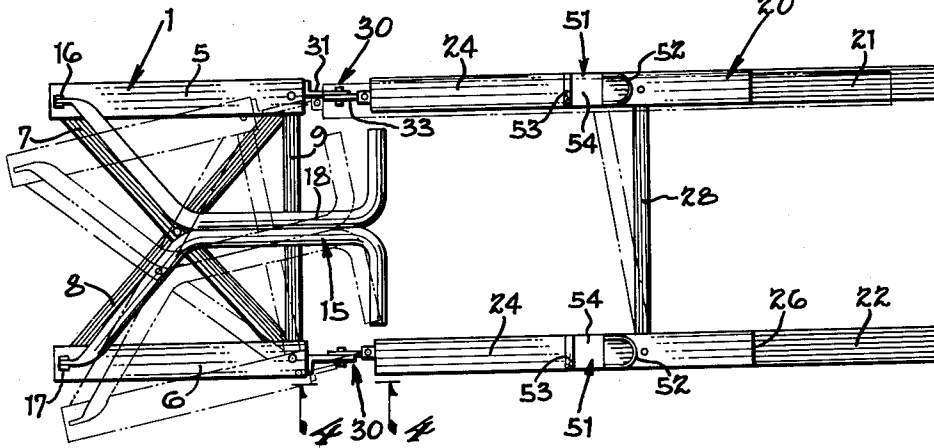


Fig. 2

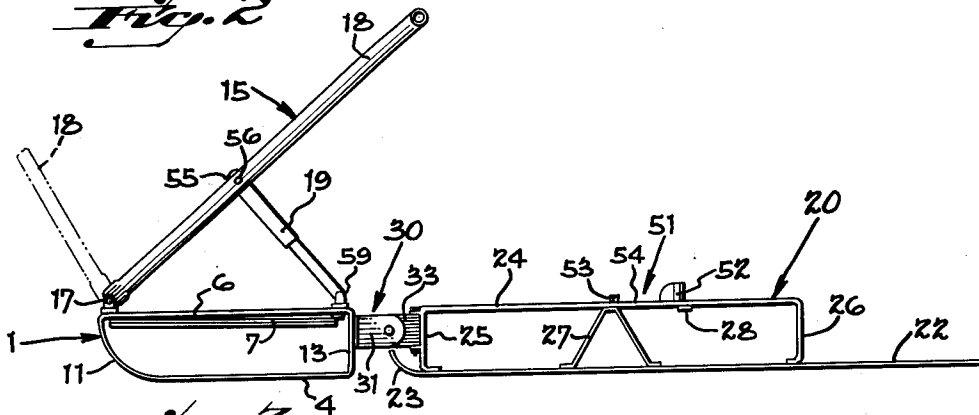


Fig. 3

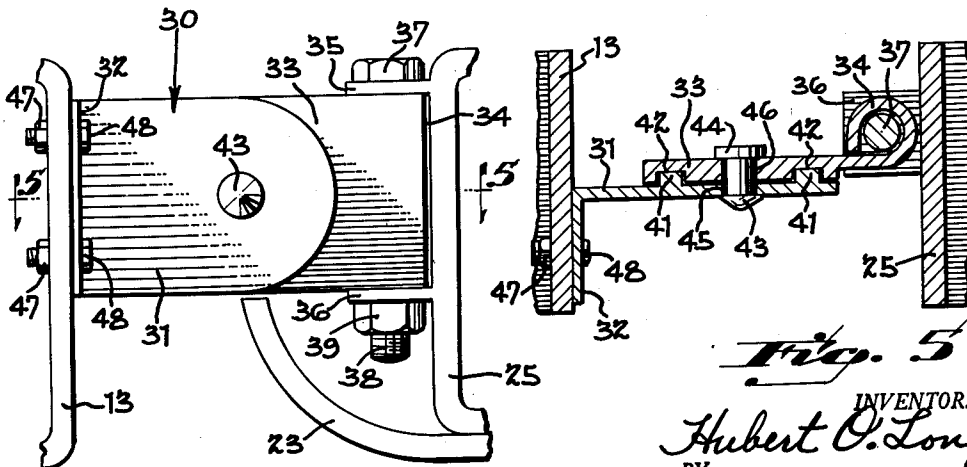


Fig. 4

Fig. 5

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3 Claims. (Cl. 280-16)

This invention relates to a device which combines a portion of the action and difficulty of skiing with the stability and ease of sled riding.

It is an object of this device to provide a ski-sled structure which is operated from a standing position and which is steered substantially by body and leg action similar to that employed in skiing.

It will be appreciated that little or no skill is required in the operation of a sled, whereas a high degree of skill is necessary in the proper use of skis. The difficulty encountered in learning to ski lies in the acquisition of the skill and strength necessary to control the individual skis, which are free to move in any conceivable manner with respect to each other in directions limited only by the topography of the ski base. In other words, skis are free to move with relation to each other, not only forward and backward, apart and together, but in any combination of these movements, in many of which the skis often do not remain in their desired parallel relationship. The ski-sled of this invention obviates a great part of these difficulties by providing a device with ski-like runners which, while free to move forward and backward a limited distance with regard to each other, are so constructed as to remain in a parallel attitude at all times.

In combining the action of the sled and ski, it is a prime object of this device to provide an easy means of teaching an individual to ski by providing for comparatively stable erect coasting operation depending in part upon the use of the legs and body to steer the device and to cause it to remain upright.

It is a further object of the invention to provide a coasting device adaptable to snow, ice or dry weather conditions.

A further important feature resides in the adaptability of the invention to use on rough terrain through the utilization of a pair of double action hinges which connect a front sled steering portion and a rear ski portion. Each hinge is designed to permit rotation in both a substantially horizontal and a substantially vertical plane with the result that the front sled portion may be turned to the right or left with relation to the ski portion to steer the device, by use of the horizontal action of the hinges; and the sled portion may at the same time be headed up or down with relation to the ski portion to negotiate rough terrain, by use of the vertical action of the hinges.

A further object is to provide a snow coasting device which is designed for smooth operation, even in fresh or deep snow.

For the attainment of these and such other objects as may appear or be pointed out, I have shown an embodiment of my invention in the accompanying drawing, wherein:

FIGURE 1 is a perspective view of the device.

FIGURE 2 is a partially diagrammatic top plan view of the device.

FIGURE 3 is a partially diagrammatic side elevational view of the device.

FIGURE 4 is an enlarged side elevational view of the hinge portion of the device.

FIGURE 5 is a cross-sectional view taken along line 5-5 of FIGURE 4.

FIGURE 6 is a side elevational view of an alternative embodiment of the device.

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FIGURE 7 is a cross-sectional view taken along lines 7-7 of FIGURE 6.

As seen with regard to FIGURE 1, the device is comprised of a rigid, front sled steering portion 1 and a rear ski portion 20. These portions are interconnected by means of a pair of double acting hinges 30 which provide the swivel action that will be described in detail later on. It is to be noted that the runners 3 and 4 of sled portion 1 form extensions of the runners 21 and 22 of the rear ski portion 20.

It may be seen in FIGURE 1 that the sled portion 1 comprises a pair of wide, parallel runners 3 and 4 which terminate in forward prow 11, these runners being topped with top rails 5 and 6 which are joined to the prows 11 of the runners 3 and 4 at their forward ends, and connected to the runners at their rear ends through vertical braces 13. The top rail structure is rigidified by means of cross bars, such as 7, 8 and 9 which are joined to the top rail structure by means known in the art. It is to be understood that any other arrangement of cross bars which will rigidify sled portion 1 would come within the teaching of the invention.

The front sled portion 1 is provided with steering means 15 which are pivotally joined to the front portions of top rails 5 and 6 as shown at 16 and 17. The steering means includes a handle 18 which can be pivoted by means of pivotal connections 16 and 17, so as to extend angularly toward the rear of the front sled portion to meet the grasp of an operator riding on the rear ski portion. The handle 18 may also be pivoted forwardly to serve in towing the device as is shown diagrammatically in FIGURE 3. Handle 18 is rearwardly braced by a telescopic brace 19 which pivotally interconnects the central portion of handle 18 with the rear cross bar 9 of front sled portion 1 as at 55 and 59. Telescopic brace 19 keeps the handle 18 from collapsing all the way back down upon the skis when not in use and at the same time allows for an adjustment in the angle at which handle 18 extends backwardly, depending on the height of the operator. Brace 19 is detachably joined to handle 18 at pivot point 55 by pivot pin 56 so that the brace can be temporarily disconnected from the handle when it is desired to pivot the handle all the way forward to use it as a means for towing the device.

The rear ski portion 20 of the device comprises a pair of parallel ski runners 21 and 22 and complementary top rails 24-24. It will be seen in FIGURE 3 that top rails 24 are supported from the skis by means of vertical front and rear braces 25 and 26 and intermediate braces 27. It will be noted further that the front portions of ski runners 21 and 22 terminate in upwardly curved prows 23 so as to provide smooth operation over snow and ice.

As shown in FIGURE 2, the top rails 24 of ski portion 20 are pivotally interconnected by means of cross bar 28. Cross bar 28 is of the same length as horizontal cross bar 9 in sled portion 1 so that when the ski runners are aligned directly behind the runners 3 and 4 of sled portion 1 as shown in FIGURE 2, the ski runners will be exactly parallel and will, in effect, be extensions of the runners 3 and 4 in sled portion 1.

Top rails 24 are provided with shoe stirrups 51, each of which comprises a heel cup 52 and a toe strap 53 which are mounted on a plate 54, large enough to accommodate the boot or shoe of the rider. The use of these stirrups is illustrated in FIGURE 1, where the toe of a rider can be seen inserted under the toe straps 53 and the heels forced down into the heel cups 52. With reference to FIGURE 3, it may be seen that intermediate brace 27 is provided directly under shoe stirrup 51 so as to directly support the weight of the rider.

As stated before, the front and rear portions of the device are swivelly interconnected by a pair of hinges 30.

Each hinge 30 is composed of two overlapping plate portions; forward hinge plate 31 and rear hinge plate 33. With reference to FIGURE 5, it may be seen that forward hinge plate 31 is provided with an angular flange 32 which is rigidly fixed to vertical brace 13 at the rear of sled portion 1 by means of nuts 47 and bolts 48. In FIGURE 4, it may be seen that rear hinge plate 33 is connected to the front vertical brace 25 of ski portion 20 by means of a loop 34 which is formed in the end of rear hinge plate 33. Loop 34 is disposed vertically between upper and lower locking eyes 35 and 36 which protrude from and can be integral with the forward wall of vertical brace 25. Upon axial alignment of the loop 34 between the locking eyes 35 and 36, a hinge pin 37 is inserted through the eyes and the loop to lock the loop to vertical brace 25. In the preferred embodiment, the bottom of hinge pin 37 is screw threaded, as at 38 to receive a locking nut 39 which locks the hinge pin in position to maintain the connection between loop 34 of hinge plate 33 and ski runner portion 20. It is to be appreciated that this connection allows for pivotal action substantially similar to a common door or gate hinge and permits hinge plate 33 to swing in a horizontal manner such as that that would be involved in the turning of the sled portion to the right or left in relation to the rear ski portion.

The vertical action of the hinge is obtained through the method of joining hinge plates 31 and 33. With reference to FIGURE 5, it will be seen that an annular flange 41 projects from the inside face of hinge plate 31 and that the inside face of hinge plate 33 has an annular groove 42 in it, designed to loosely receive annular flange 41. The central portions of hinge plates 31 and 33 are provided with bores 45 and 46 which are designed to communicate upon the mating of flange 41 in annular groove 42. Hinge plates 31 and 33 are pivotally mounted together by the insertion of a locking bolt 43 which is inserted through bores 45 and 46 and locked in place by locking nut 44. A washer (not shown) may be used to keep the locking nut 44 from becoming loosened upon the pivoting of plates 31 and 33 around locking bolt 43.

The purpose of the opposing hinge plates 31 and 33 and the annular flange receiving groove, as described, is to provide vertical stability to the hinge by absorbing twisting torque as they are forced to pivot about locking bolt 43. It will be appreciated that annular flange 41 will be confined to the groove or channel 42 and bear some of the pivotal force that would otherwise be brought to play solely upon locking bolt 43.

It is to be remembered that hinges 30 provide the sole physical connection between sled portion 1 and ski portion 20, in that forward hinge plate 31 is fixed to the sled portion and the rear hinge plate 33 is fixed to pivot horizontally from the opposing front vertical brace 25 of ski portion 20. The two hinge plates 31 and 33 are further fixed to pivot vertically about locking bolt 43 (which locks them together and in this way connects sled portion 1 and ski portion 20) and the inside wall defined by annular groove 42. When on a flat surface, only the horizontal action of the hinges will be involved, as the sled portion is turned to the right or left to pivot hinge loop 34 around hinge pin 37. As rougher terrain is encountered which would cause the sled runners 3 and 4 to occupy a plane other than that occupied by ski runners 21 and 22, the vertical action of the hinge will come into play and hinge plates 31 and 33 will revolve in opposite directions around locking bolt 43, depending upon whether the sled portion 1 moves up or down in relation to the plane occupied by the ski runners.

It is to be appreciated that while this hinge structure is preferred for obtaining best results, other known hinge means providing similar action could be utilized to make the device successfully operative.

A principal novelty of the device resides in the riding action obtained from the combination of the rigid sled portion 1, its steering mechanism 15 and the non-rigid rear

ski runners. Due to the fact that ski runners 21 and 22 are designed to slide independently forward and backward, that is, independently in relation to their respective longitudinal axes, it is possible to steer, or at least aid in steering the device by movement of the feet on the ski runners, thereby providing limited action quite similar to that encountered with real skis. When, for instance, as is shown in the diagrammatic portion of FIGURE 2, the weight of the operator is shifted to move the right ski runner 21 ahead of the left ski runner 22, the front sled runners 3 and 4, which are rigidly fixed together, will be turned to the left, thereby causing the device to turn to the left. In the same manner, the device can be made to turn to the right by causing the left ski runner 22 to slide ahead of the right ski runner 21. Due to the fact that this forward and backward movement of one ski runner in relation to the other is limited by cross bar 28, which pivotally interconnects the ski runners, the runners are forced to remain in spaced parallel relationship, thereby resisting the tendency to "spread" and obviating a prime hazard which accompanies the use of real skis.

It is to be noted that the foot steering action described above is used in conjunction with the steering mechanism 15 so that the two means of steering, by foot and by hand, may be combined, depending upon the ability or intent of the operator. Operators first experiencing use of the device will depend heavily upon the handle 18 for steering and support, but as they become more practiced, they will rely more heavily on the action of the legs and body to guide the device and will use the handle 18 primarily to maintain their equilibrium. In this connection, the device is valuable to teach the art of skiing as the leg and body action which can be utilized to steer the device is comparable to that used in skiing. When this fundamental aspect has been learned, the graduation to the successful operation of real skis is much more easily obtained.

By releasing hinge pin 37 and by disconnecting cross bar 28, a user of the device can provide himself with crude skis which can even further advance his skill in the skiing art. In fact, with the sled portion 1 removed and the cross bar 28 still attached, a beginner can experiment easily with the art of "parallel skiing" without fear of having to prevent the skis from spreading.

It is to be further noted that while the forward and backward motion of the skis is limited, due to their connection to the front sled portion and the common cross bar 28, and while their parallel relationship is also governed by these connections, it is possible for the skis to adopt different planes during their use. For example, if the left front runner 4 of sled portion 1 were to strike a bump, the rigid sled section would be tilted sharply downwardly to the right but the following ski portion would be affected in a different manner. Since the skis are not rigidly interconnected, the left ski runner 22 (following the left front runner 4 of sled portion 1) would "slide up" on the bump while the right ski runner 21 would remain substantially in its original plane, thus creating another of the movements common to the art of skiing. In this connection, it is to be emphasized that the novel connection between hinge plates 31 and 33 as described above is designed to protect the hinge structure and particularly the locking bolt 43 from shearing due to this kind of twisting torque. At the same time, the opposing faces of each hinge add vertical stability to the device, thus prohibiting the individual ski runners from twisting or "edging" upon encountering rough terrain.

An alternative embodiment of the device may be seen disclosed in FIGURE 6. This embodiment utilizes the addition of front wheels 60 and rear wheels 61 which make the device adaptable to use on any hill or grade without snow. As seen in FIGURE 7, the rear wheels 61 are individually mounted in openings 66 provided in the bottom of the ski runners by means of axles 65,

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the opposite ends of which are rotatably mounted in split sleeve bearing boxes 63. Bearing boxes 63 are mounted to the ski runners on opposite sides of openings 66 by such known means as rivets 67. A pair of rear wheels 61 are mounted in this manner in front and in back of shoe stirrups 51 to provide stable support for the rider, while it is preferred that the rear wheels 61 be individually mounted on ski runners 21 and 22, due to the individual forward and backward movement of the ski runners. However, due to the fact that runners 3 and 4 of front sled portion 1 are rigidly interconnected, front wheels 60 may be mounted on an axle (not shown) spanning the distance between runners 3 and 4, or, alternatively these wheels may be mounted individually, in the manner disclosed for rear wheels 61.

The preferred embodiment of the device can be provided with the necessary bearing boxes and wheel and axial attachments so that it can be converted from snow operation to dry operation by the purchaser.

A further advantage in the device, resides in the ease with which it glides over newly fallen snow. It will be appreciated that sleds and skis which bear the weight of a rider are forced to make their own track when descending a slope of newly fallen snow. Due to this fact, even 2" or 3" of snow is often found too deep for practical sledding due to the facts that the snow has not been packed and that no track has been prepared for a good base.

With reference to the instant device, it is to be noted that the front sled portion bears little or no weight, depending upon how heavily the rider leans on the steering mechanism. Due to this fact, the runners 3 and 4 easily ride through newly fallen snow as there is not enough weight on these runners to cause them to slip deeply enough into the snow to encounter resistance to forward movement. It will be appreciated that substantially all the weight of the rider is borne by the ski runners 21 and 22 and that these runners would normally sink deeply enough into fresh snow to encounter considerable resistance to their forward movement. However, since ski runners 21 and 22 are substantially aligned with sled runners 3 and 4, the latter mentioned runners break a track for the following ski runners and provide for easy, sliding motion, even in heavy snow. This action is important in any operation of the device, but especially in conjunction with use by children who quickly tire of an afternoon sport when forced to engage in vigorously prodding their sledding device in order to slowly execute a slope.

Although the invention has been described in its preferred form, with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details and construction and the combination and arrangements of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

I claim:

1. A ski sled comprising a pair of parallel runners,

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each said runner having a forward portion and a rearward portion normally parallel to each other, said forward and rearward portions of each runner being pivotally interconnected for pivotal movement in a substantially vertical and a substantially horizontal plane, means rigidly interconnecting the forward portions of said runners, means pivotally interconnecting the rearward portions of said runners and a steering mechanism fixed to said rigidly interconnected forward runner portions.

2. A ski sled comprising a pair of parallel runners, each of said runners being swivelly interconnected at a point between its ends to provide a front portion and a rear portion, means rigidly interconnecting the front portions of said runners, means pivotally interconnecting the rear portions of said runners, the rear portions of said runners being normally parallel to the front portions of said runners, foot stirrup means attached to said rear runner portions, steering means pivotally connected to said front runner portions to provide means for steering said device when pivoted backward toward said rear runner portions and to provide means for towing said device when pivoted forward toward the front of said device.

3. A ski sled comprising a pair of parallel runners, each said runner having a forward portion and a rearward portion, means rigidly interconnecting the forward portions of said runners, means pivotally interconnecting the rearward portions of said runners, steering means fixed to said rigidly interconnected forward runner portions, means pivotally interconnecting said forward and rearward portions of each runner for pivotal movement in at least one plane, each of said means comprising, a forward hinge plate fixed to said rigid forward portion and a rear hinge plate pivotally fixed to one of said rearward runner portions, the inner face of said forward hinge plate having an annular flange coextensive therewith, the inner face of said rear hinge plate having an annular groove defined therein, means pivotally joining said plates with said annular flange residing in said annular groove for rotation of said plates about said annular groove and flange in a plane perpendicular to the plane of pivotal action transcribed by said rear hinge plate as a result of said pivotal mounting to said rear runner portion.

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