April 17, 1962 T. A. DWORAK 3,030,123

SKI MOUNTING APPARATUS AND SLED THEREFOR

Filed March 10, 1960

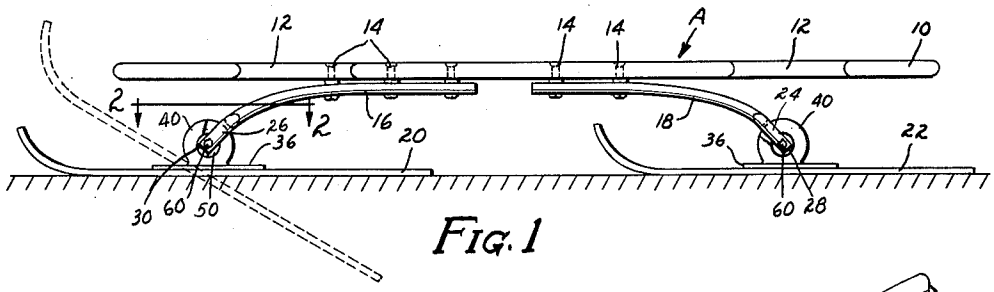


FIG. 1

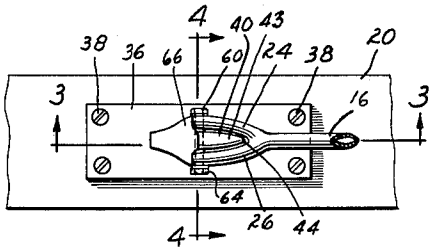


FIG. 2

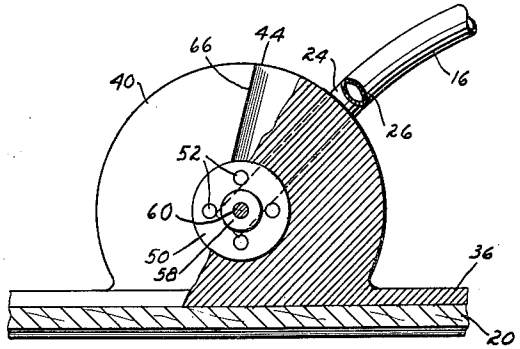


FIG. 3

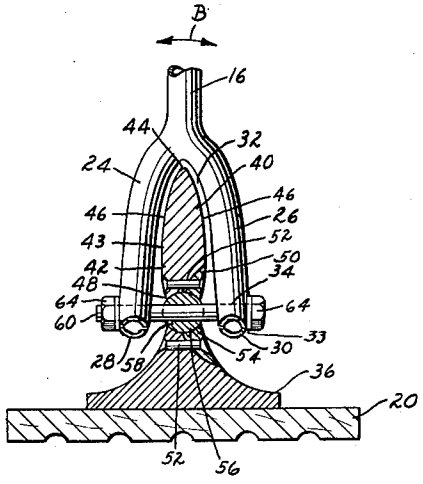


FIG. 4

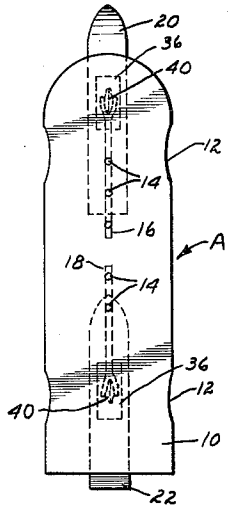


FIG. 5

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SKI MOUNTING APPARATUS AND SLED THEREFOR

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This invention relates to a new and improved snow vehicle; in particular it concerns a novel sled structure and the means employed for mounting skis and the like thereto.

Conventional hand sleds, bob sleds, and the like are generally characterized by a flat load carrying platform that is rigidly mounted on a pair of spaced parallel longitudinal runners. Some of the more refined types, such as bob sleds, have articulated pairs of tandem runners adapted for steering by moving the forward pair in the desired direction. And most of them use runners that are relatively narrow in width which are primarily adapted for icy surfaces or surfaces of hard compacted snow. The problem of readily controlling the speed and direction of these sleds is aggravated by the rigid parallel arrangement of the runners inasmuch, as in the case of hand sleds, the runners themselves must be literally forced from a parallel longitudinal position to a warped curved position in order to change direction. The bob sled, in addition to being more complicated in construction and higher in cost than the hand sled, is generally quite heavy and difficult to manage.

It is therefore an important object of this invention to provide an improved sled.

Another object of this invention is to provide an easily maneuverable light-weight sled.

Yet another object of this invention is to provide an improved sled having novel ground engaging means.

A further object of this invention is to provide in a hand sled novel means for attaching runners thereto.

Another object of this invention is to provide novel means for attaching skis to a load carrying framework.

Yet another object of this invention is to provide novel means for connecting skis to a load carrying structure whereby to facilitate accurate steering control of the structure during a downhill run.

Still another object of this invention is to provide in a sled having skis for engaging the ground novel means for transmitting a weight shift on the sled to the ski to cause rapid and easy steering of the sled.

A further object of this invention is to provide in a ski mounting structure means for limiting the movement of the ski in two planes.

Another object of this invention is to provide novel means for yieldably supporting a sled body over ski means.

These and other objects and advantages of the invention will become apparent from a consideration of the following detailed specification and accompanying drawing wherein an embodiment of the invention is shown by way of illustration only.

In the drawing:

FIGURE 1 is a longitudinal side view of the invention with the forward ski shown in two positions;

FIGURE 2 is an enlarged fragmentary top view of the forward ski mounting assembly taken substantially on the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged fragmentary side view of the forward ski mounting assembly, partially in section, taken on the line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged fragmentary front view of the forward ski mounting assembly, partially in section, taken on the line 4—4 of FIGURE 2; and

FIGURE 5 is a top plan view of the invention.

In FIGURES 1 and 5 of the drawing, the invention in its entirety, designated by the reference character A, includes an elongated rectangular load carrying platform 10 having hand holds 12. Platform 10 may be constructed of wood, light metal, or similar materials. Centrally fastened, as by bolts 14, to the undersurface of platform 10 are a pair of opposed curved depending elongated support members 16 and 18, which may be tubular in cross section. As shown in FIGURE 1, forward support member 16 extends downwardly and forwardly from its point of attachment to platform 10, while rear support member 18 extends rearwardly and downwardly from its point of attachment to platform 10. Both support members 16 and 18 are positioned coincident with the longitudinal centerline of platform 10 and connect at their free ends to skis 20 and 22, respectively. Inasmuch as the structural features of the ski mounting means are identical, for both forward support member 16 and rear support member 18, except for reverse symmetry about a central vertical plane, the description that follows will speak only in terms of forward support member 16, it being understood that the same considerations will apply to the rear support member, with the exception noted.

Turning now to a consideration of FIGURES 2 to 4, inclusive, support member 16 terminates at the lower end thereof in two equal branches or arms 24 and 26 which are spaced apart at the lower ends 28 and 30 thereof to define an elongated tapered arched opening 32 therebetween. Holes 34 through arms 24 and 26 receive bolt 60, hereinafter described in more detail. Slot 33 provides mounting access for bolt 60.

Mounted on ski 20 at approximately the mid point thereof is a base plate 36 which may be fastened thereto by screws 38 or like means. Integral with (as shown) or attached to base plate 36 is an upstanding or vertically positioned limit member 40. Limit member 40 is characterized by a substantially disc like upper body 43 (see FIGURE 3) which in cross section tapers from a place of maximum width 42 near the center thereof to a relatively narrow upper surface 44, as disclosed in FIGURE 4. It can be seen that the tapering sides 46 of body 43 follow generally the inner contour of opposing arms 24 and 26 of support member 16 leaving a narrow zone 32 therebetween.

At the base of upper body 43 limit member 40 narrows down into a lesser thickness, as at 48. One side thereof is dished out to permit mating circular arcuate plate 50 to be removed therefrom by removing bolts 52 thereby exposing an internal spherical bearing cavity 54 coincident with a transverse hole 56 therein. A solid spherical load transmitting member 58 formed integral with opposed stub shafts 60 is movably carried in cavity 54. Shafts 60 fit into holes 34 on the arms 24 and 26 and are secured thereto by suitable fastening means 64.

Another feature of limit member 40 is the provision of an integral stop shoulder 66 on the forward upper sector of upper body 43 which prevents the forward movement of arms 24 and 26 and therebeyond, or conversely, the rearward tipping of ski 20 beyond the point illustrated by the dotted lines of FIGURE 1.

The foregoing description has dealt with the structural details of the invention; a discussion of the operating characteristics will now be given to illustrate the manner in which the various parts cooperate to produce the desired results.

It is contemplated that either one or a plurality of persons may ride the sled depending upon the size of the sled. In running down a slope steering is accomplished by leaning to one side or the other or by a similar means

of shifting the weight imposed upon support members **16** and **18**. The resulting weight shift is transmitted by means of arms **24**, **26** and spherical member **58** through limit member **40** and base plate **36** to the skis **20** and **22**. Rotational displacement is permitted by the movement of spherical member **58** in limit member **40**; its degree of travel however is limited by the contour of upper body **43** and arms **24** and **26**. This is so because the inner surface of each arm **24** and **26** ultimately engages the corresponding outer surface **46** of body **43** thereby preventing farther angular motion in the direction indicated. This is graphically shown by the arrow designated by reference character B in FIGURE 4. When arm **24** or **26** engages surface **46** of body **43** the result is that the force produced by a weight shift is then transmitted to an edge of the ski resulting in a turning movement.

The floating type of control which results from this construction allows for greater safety and smoother response in a downhill run as the effect of a sudden weight shift is dampened before being transmitted to the ski and exaggerated movements are effectively reduced to proper proportions. In addition, the spring mounting afforded by the arrangement of support members **16** and **18** permits a smoother ride. Lateral displacement of the skis is also avoided by the construction shown. If deemed desirable, the rear of the sled may be equipped with a pair of spaced parallel runners to provide three-point suspension. In such a case, the steering can be manipulated through the use of the forward ski.

Thus there has been shown and described a new and improved sled and ski mounting apparatus therefor. The use of a ball type joint between the upper supports and the ski in conjunction with a central angular displacement limiting means provides a novel suspension and control structure for a sled.

The invention has been disclosed for the purpose of illustration only; any limitation to a specific embodiment is clearly not intended, the scope of the invention being defined only by the following appended claims.

I claim:

1. Apparatus for mounting a ski to a sled including a base member of greater length than width securable to a ski, a control body extending upwardly from said base member having converging sides terminating in an apex generally coincident with the longitudinal axis of the ski, said body having a bore generally transverse to said axis, hollow universal pivot means mounted in the bore of said body, a shaft carried by said pivot means, and a sled support member having a yoke at the lower end thereof and sled mounting means at the upper end thereof, the yoke of said support member having a pair of arms each attached to an end of said shaft, each of said arms being in spaced relation to said body and intermittently engageable with a side of said body whereby to impart lateral edging movements to said ski in response to weight shifts transmitted from said sled through said supporting member to said control body, said support member being elongated and curved upwardly from said yoke to terminate in a sled mounting position horizontally spaced from said base member.

2. The structure of claim 1 wherein said yoke is restricted in its movement in a vertical plane about the axis defined by said shaft.

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