Aug. 18, 1964 F. E. MILLIS 3,145,030

SLED FOR SNOW AND WATER

Filed Feb. 19, 1963 2 Sheets-Sheet 1

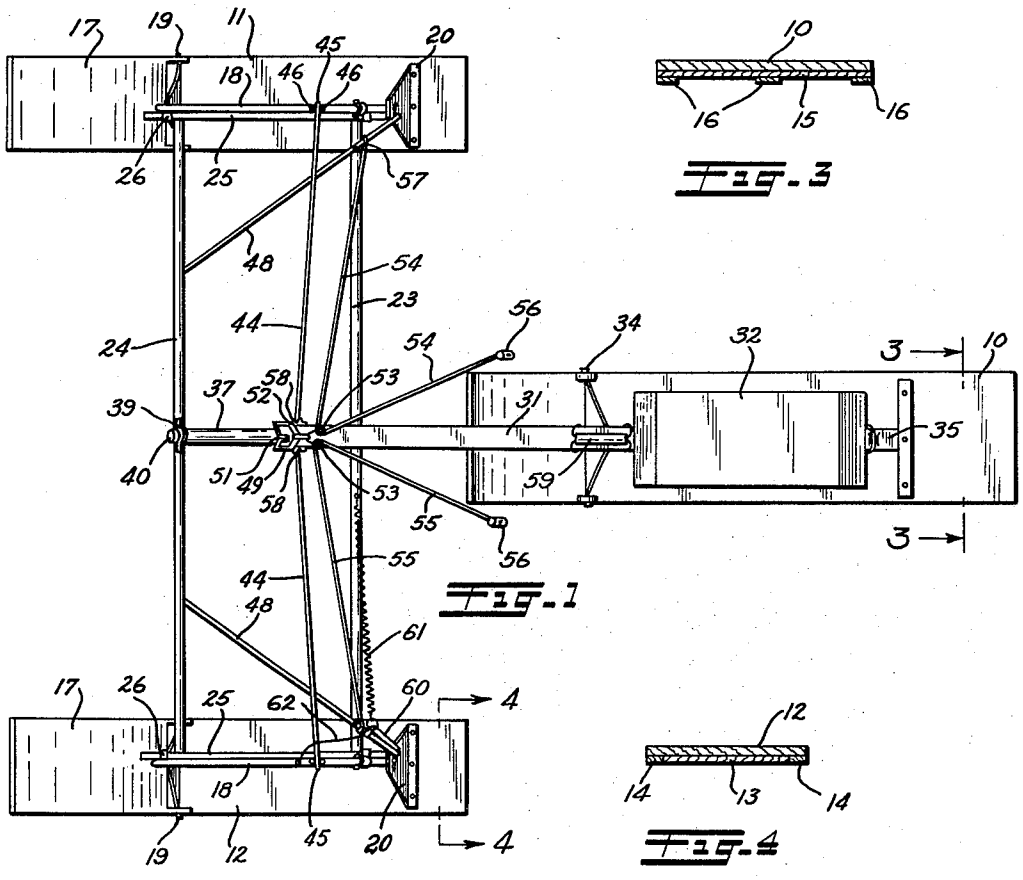

Fig. 1

Fig. 3

Fig. 4

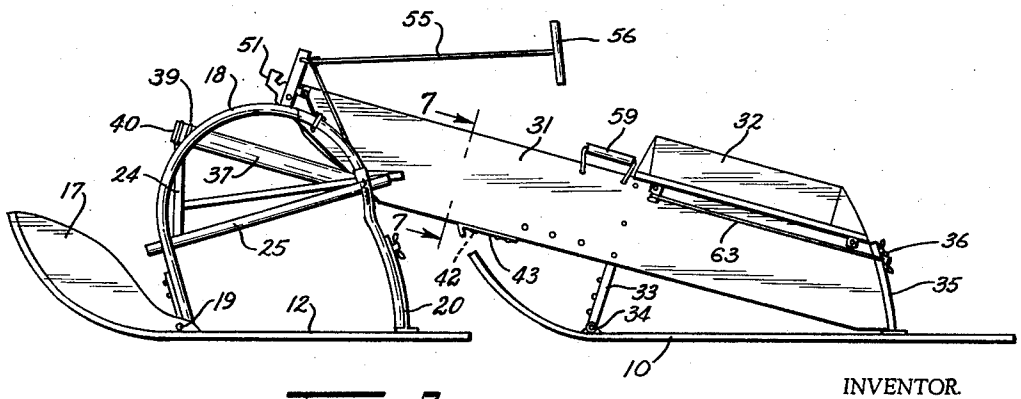

Fig. 2

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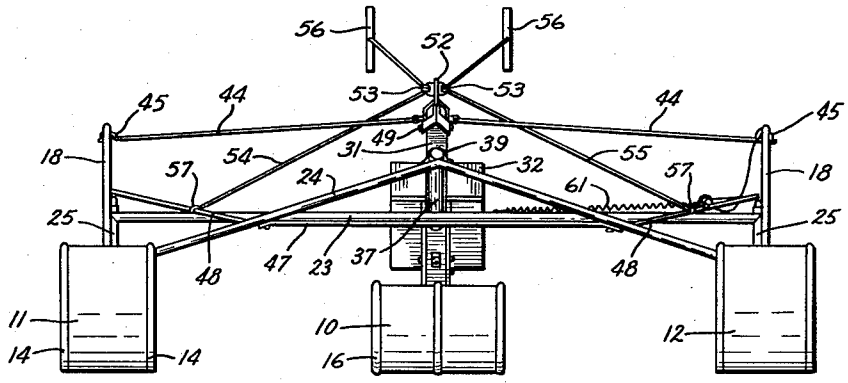

Fig. 5

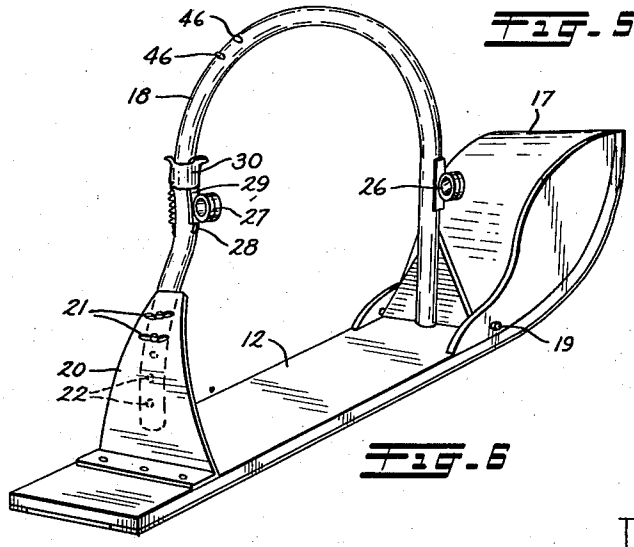

Fig. 6

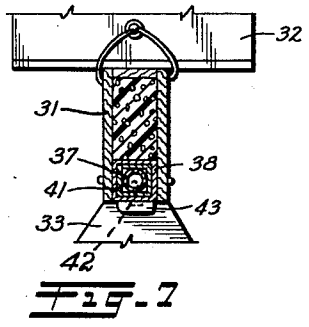

Fig. 7

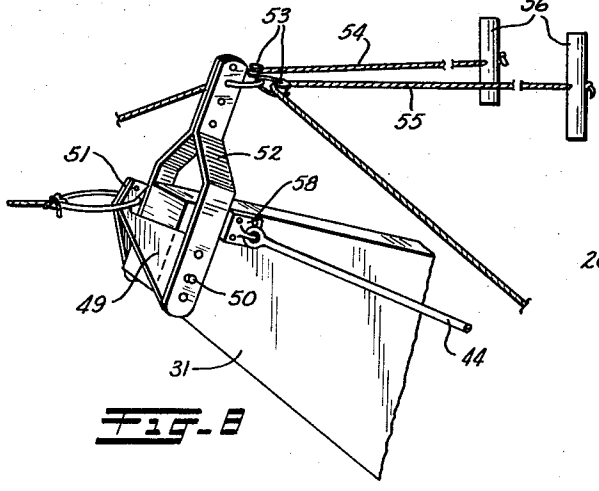

Fig. 8

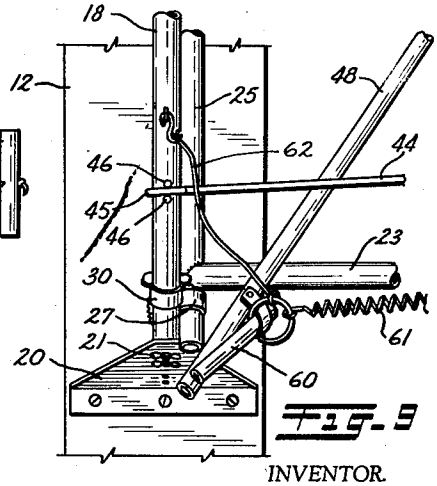

Fig. 9

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3,145,030

SLED FOR SNOW AND WATER

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6 Claims. (Cl. 280—16)

This invention relates to what might be termed a ski sled, that is, to a rider-carrying vehicle which will have a ski-like action when coasting or being towed over snow, ice or water.

The principal object of the invention is to provide a light weight sled of this type which can be easily carried up a ski slope by the rider; which can be quickly and easily disassembled so that it may be taken on a ski lift and quickly reassembled to descend the slope; and which will be under safe stable control of the rider at all speeds and under all conditions.

Other objects are: to provide a ski sled with ski-like runners which will incline or bank similarly to the action of a skier's skis for making sharp turns so that a desired trail may be easily and accurately followed at high speed without snagging, side sliding, tipping or dragging; to provide a sled which can be quickly stopped when desired by the rider; to provide a sled which will automatically stop should the rider become dismounted so that it may be quickly retrieved without damage to the sled or other occupants of the slope; to provide both manual and automatic means for disengaging the sled from a tow rope; and to provide means for quickly reconnecting the sled to a tow rope when it is desired to proceed.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

FIG. 1 is a top plan view of the improved ski sled;

FIG. 2 is a left side view thereof;

FIG. 3 is a detail cross section taken on the line 3—3, FIG. 1;

FIG. 4 is a similar detail cross section taken on the line 4—4, FIG. 1;

FIG. 5 is a front view thereof;

FIG. 6 is a detail perspective view of a left front runner as employed in the sled;

FIG. 7 is a detail cross section taken on the line 7—7, FIG. 2;

FIG. 8 is a fragmentary detail view of the forward extremity of a medial frame employed in the improved sled; and

FIG. 9 is a fragmentary detail view looking downwardly on the left front runner and its attachments.

The improved ski sled employs three runners: a rear runner **10**, a right front runner **11**, and a left front runner **12**. The runners are all preformed from suitable hard wood such as straight grained ash planks to present a flat elongated bottom with a curvated, up-turned, ski-like forward extremity. The two front runners are similar and the bottom of each is reinforced and protected by a metallic (preferably aluminum) bottom plate **13** and with inset metallic corner reinforcing strips **14**. The rear runner is also provided with a metallic bottom plate **15** below which longitudinally extending guide strips **16** project.

Each of the front runners is provided with a hollow float tank **17** secured to the runner immediately behind the up-turned forward extremity thereof. An inverted, U-shaped runner mounting yoke **18** is hingedly mounted adjacent its lower forward extremity to each of the front runners as indicated at **19** and extends arcuately upward, rearward and downward to a position adjacent the rear of each front runner. The lower rear extremities of the mounting yokes **18** are secured to arcuate mounting brackets **20**, mounted adjacent the rear of each front runner, by means of mounting bolts provided with wing nuts **21**. The lower rear extremities of the yokes are provided with a plurality of bolt holes **22** to receive the mounting bolts so that the relative angle between the yokes **18** and the front runners **11** and **12** can be pre-adjusted and preset about the axis of the hinges **19** as desired.

The two front runners are maintained in parallel, spaced relation by means of a cross frame extending therebetween. The cross frame comprises a straight rear frame tube **23** and an inverted V-shaped front frame tube **24** which are welded, or otherwise fixedly secured at their extremities to parallel, side frame tubes **25**. The inverted V-shape of the front frame tube **24** causes its mid-section to rise above the mid-section of the rear frame tube **23**, as shown in FIG. 5. The front frame tube is braced by a cross brace tube **47** riveted at its extremities beneath the tube **24**. Foot rest bars **48** extend outwardly and rearwardly from the extremities of the brace tube **47** and are riveted on and extend rearwardly and outwardly from the rear frame tube **23**.

The side frame tubes **25** are respectively, detachably and hingedly secured to the mounting yokes **18** of the two front runners. As illustrated, this is accomplished by mounting an inwardly facing, fixed, forward bracket ring **26** on the forward leg of each yoke and an inwardly extending, demountable, rear bracket ring **27** on the rear leg of each yoke. The latter ring may have any quick detachable construction. As illustrated, it is provided with a downwardly depending foot hook **28** which hooks into the tube of the yoke and with an upwardly extending pad **29** which is detachably secured against the yoke by means of a vertically slidable clamping sleeve **30**.

The rings **26** and **27** are so positioned as to incline the side frame tubes **25** upwardly at the rear on an angle of substantially 15° from the horizontal. Assembly is accomplished by sliding the side frame tubes forwardly into the forward fixed bracket rings **26**, thence placing the rear bracket rings **27** on the side frame tubes and securing the latter rings to the yokes by means of the foot hooks **28** and the clamping sleeves **30**.

A body member **31** is supported on the rear runner **10** and extends medially-forward therefrom at an upward angle and supports a padded seat **32** for the rider adjacent its rear extremity. The body member **31** is in the form of an elongated wooden box with two parallel, separated sides. The intervening space betwen the two sides is preferably filled with light-weight buoyant material such as plastic styrofoam.

The forward extremity of the member **31** is supported by a front leg member **33** which is transversally pivoted as indicated at **34** immediately behind the upturned forward extremity on the runner **10**. The rear extremity of the body member **31** is mounted for vertical adjustment in a rear mounting bracket member **35** by means of vertically adjustable bolts and wing nuts **36** similar to the front mounting brackets **20**. Thus the relative angle between the body member **31** and the rear runner can be adjusted and preset as desired.

The member **31** is provided with a suitable carrying handle **59** and with a retaining cable **63** below the seat **32** which can be used to tie the two front runners and their yokes to the sides of the body member **31** for carrying the disassembled sled.

The body member and rear runner assembly can be quickly attached to or detached from the front runner assembly through the medium of a tubular pivot shaft **37**

mounted on the frame tubes **23** and **24**, and a pivot shaft socket tube **38** mounted on the body member **31**.

The pivot shaft **37** is rotatably mounted in bearing hangers **39**, there being one bearing hanger mounted at the midpoint of each of the frame tubes **23** and **24**, and extending rearwardly and downwardly at an incline corresponding to the incline of the side frame tubes **25**, substantialy 15° from the horizontal. Longitudinal movement of the pivot shaft in the hangers is prevented by conventional set collars **40** attached to the shaft adjacent the hangers. A length of square tubing **41** surrounds and is riveted to the rear extremity of the pivot shaft and forms a square tenon thereon which slidably fits into the pivot shaft socket tube **38** of the body member **31**.

The pivot shaft socket tube **38** is square in cross section and is formed on and extends forwardly from the front leg member **33** below the body member **31** to receive the square tenon of the pivot shaft. The tenon is releasably locked in place by means of a latch pin **42** which is urged upwardly through the wall of the tube **38** and into the tenon thereon by means of a latch spring **43** mounted on the socket tube.

Thus, it can be seen that the front runner assembly is free to tilt back and forth about the axis of the pivot shaft and that the latter can be detached from the rear runner assembly by simply flexing the latch spring **43** to withdraw the latch pin **42**.

A tie rod **44** is connected to each side of the forward extremity of the body member **31**, on suitable connectors **58**, and extends oppositely outward terminating in hooks **45** which are hooked over the runner mounting yokes **18** between holding rivets **46** projecting upwardly from the yokes. The tie rods **44** act as connecting rods between the three runners so that when the body member is tilted to the left or right, all three runners will be simultaneously and equally tilted or banked for a turn.

A towing member **49** is tiltably mounted on an axis pin **50** at the forward extremity of the body member **31** and provided with a tow line hook **51**. Rearward tilt of the member **49** is limited by contacting the tie rod connections **58**. A steering rope post **52** is riveted to, arises from, and is tiltable with the towing members. The post **52** carries two suitable pulleys **53** over which a right steering rope **54** and a left steering rope **55**, terminating at one extremity in hand grips **56**, are trained. The other extremities of the steering ropes are connected to the foot rest bars **48** at the right and left extremities of the front runner assembly as indicated at **57**.

When coasting, the rider is seated upon the seat **32** with his feet braced against the two rearwardly projecting extremities of the foot rest bars **48** gripping one of the hand grips **56** in each hand. To make a turn to the right, the rider simple tensions the right steering rope **54** and slackens the left steering rope **55**. This tilts the post **52** to the right causing a simultaneous banking of all three runners to the right to instigate the right turn. For a left turn, the left steering rope is drawn rearwardly and the right rope is slackened to bank all runners to the left to instigate a left turn. Since the body member always banks with the turn, the rider's body is always centrifugally centered.

When banked for a turn, the angular placement of the side frame tubes **25** causes the rear of the front runners to lift and swing toward the outside of the turn to avoid dragging and side slipping.

When being towed, the tow rope is hitched to the hook **51** of the towing member **49**. The rider can instantly release the tow by simply releasing the steering ropes to allow the towing member to swing forward to release the hook from the tow rope. This also occurs should the rider be accidentally dismounted.

To provide a safety brake for coasting, a foot lever **60** is hingedly mounted on the rear extremity of one of the foot rest bars **48**, as shown in FIG. 8. The lever **60** maintains a spring **61** under tension until the foot is removed. Removal of the foot allows the lever **60** to release the spring so that it will exert tension on a cable **62** connected to a runner mounting yoke **18** to swing the latter inwardly to cause an abrupt turn which will swing the sled to rest.

While a specific form of the invention has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention what is claimed and desired to be secured by Letters Patent is:

1. A ski sled comprising:
   - (*a*) a transversely-extending cross frame;
   - (*b*) a longitudinally-extending, tiltable, medial body member rotatably attached medially of and extending rearwardly from said cross frame in T-shaped relation thereto;
   - (*c*) a rear runner mounted beneath said body member;
   - (*d*) a normally vertical runner yoke tiltably mounted at each extremity of said cross frame in parallel relation to said medial frame;
   - (*e*) a front runner mounted on and beneath each runner yoke;
   - (*f*) connecting means between said body member and said runner yokes so that the tilting movement of the body member will simultaneously and similarly tilt said yokes to guide said sled;
   - (*g*) a rider's seat mounted on said medial frame;
   - (*h*) two flexible guide elements extending from the rider's position on said seat forwardly and outwardly from said medial frame to a fixed connection adjacent each extremity of said cross frame so that alternating tension in said guide members will tilt said medial frame sidewardly relative to said cross frame;
     - the axis of tilt between the runner yokes and the cross frame being inclined forwardly and downwardly at an angle of substantially 15° from horizontal;
     - and the axis of rotation between the cross frame and the medial frame being inclined rearwardly and downwardly at an angle of substantially 15° from horizontal;
   - (*i*) means pivotally mounting the forward portion of each front runner on its yoke; and
   - (*j*) adjustable mounting means mounting the rear portion of each front runner on its yoke so that said rear portion can be vertically adjusted to preset the front runners at any desired incline from the horizontal.

2. A ski sled as described in claim 1 having:
   - (*a*) means for pivotally mounting the forward portion of the rear runner beneath said medial frame; and
   - (*b*) adjustable mounting means mounting the rear portion of said rear runner beneath said medial frame so that said rear runner can be inclined at any desired incline from the horizontal.

3. A ski sled as described in claim 1 having:
   - (*a*) a post member mounted on and arising from the forward extremity of said medial frame; and
   - (*b*) pulleys carried by said post member over which said flexible guide elements are trained to impart a reactive lateral tilt to said medial frame in consequence of varying tension in said flexible guide elements.

4. A ski sled as described in claim 3 having a towing hook member pivotally mounted on a horizontal transverse axis at the forward extremity of said medial frame to which a tow rope may be hooked, said post member being mounted on said towing hook member so that tension in said flexible guide elements will maintain said hook member in the hooked position and the release of tension in said guide elements will allow said hook member to rotate to an unhooked position.

5. A ski sled as described in claim 1 having:

(*a*) a foot rest bar on said cross frame;

(*b*) a foot rest lever hingedly mounted on one extremity of said foot rest bar;

(*c*) a spring releasable by the removal of a foot from said foot rest lever; and

(*d*) a connecting element from said spring to a runner yoke to tilt the latter in consequence of the release of said spring to impart a sharp turn to said sled.

6. A ski sled as described in claim 1 having buoyant pontoons mounted on the front runners.

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