July 7, 1964 MIGUEL FEU ALSO KNOWN AS MIGUEL FEU SERRAHIMA 3,140,099

SKI-TYPE BOB SLED

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Fig. 1

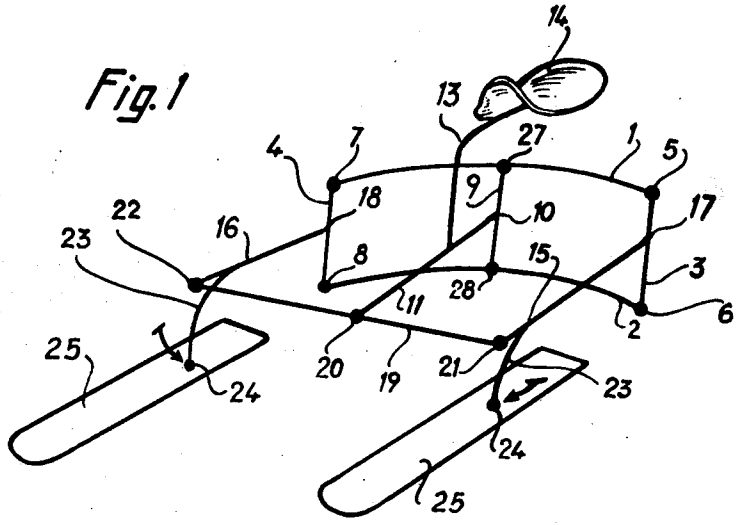

Fig. 2

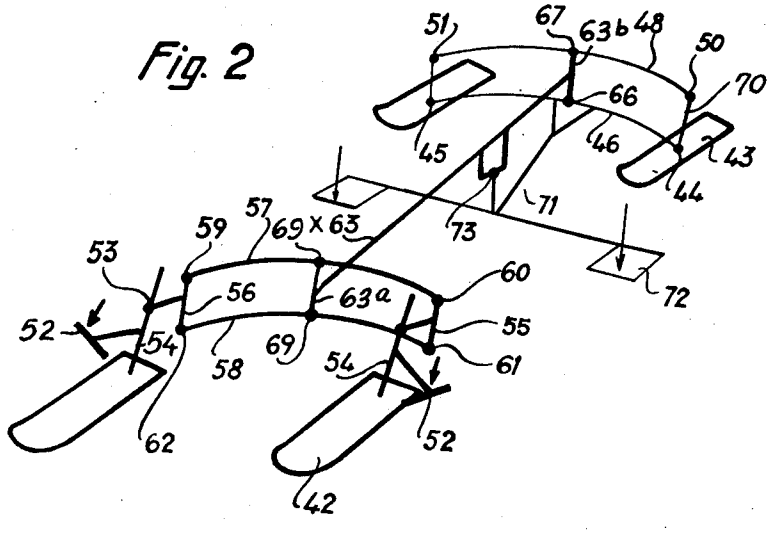

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Fig. 3

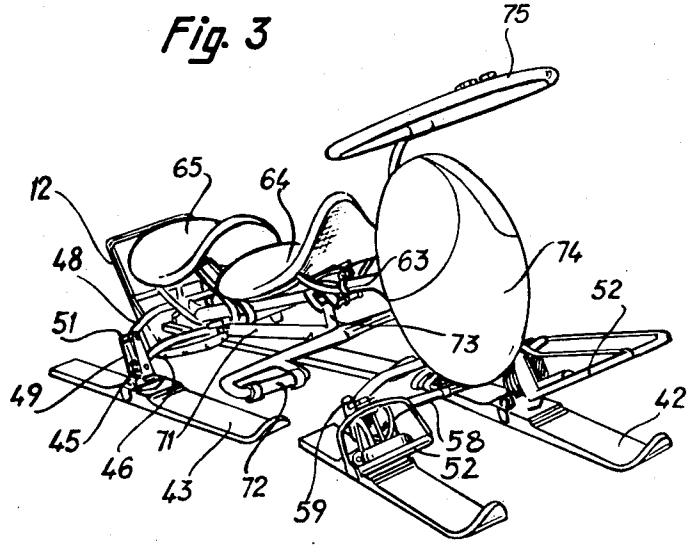
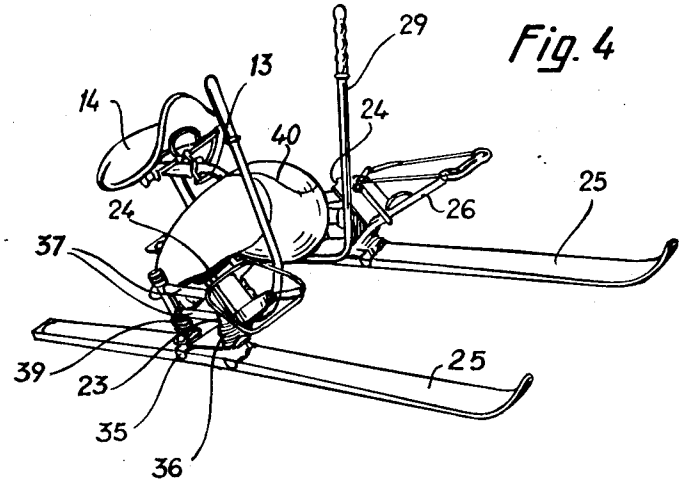


Fig. 4



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SKI-TYPE BOB SLED

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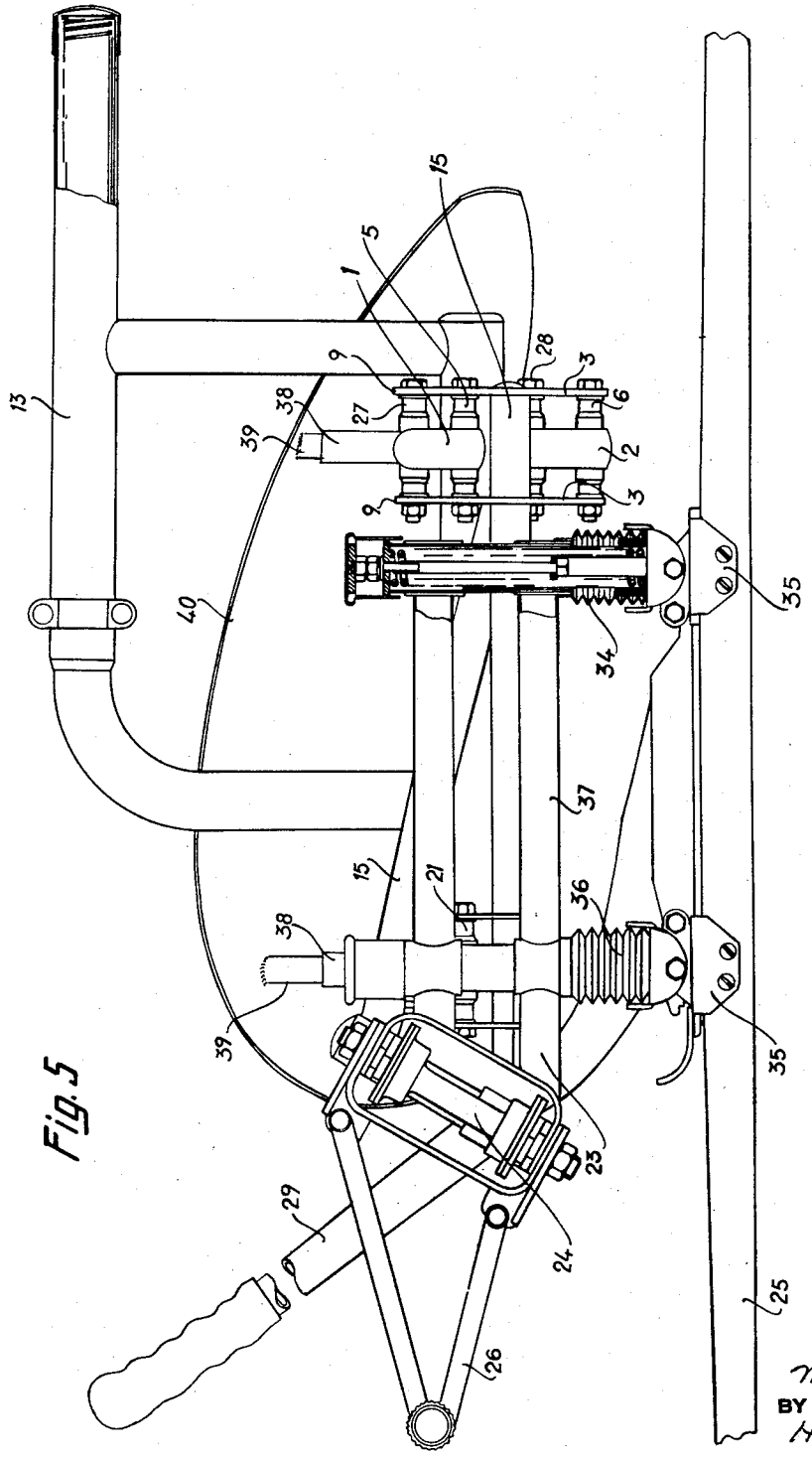

Fig. 5

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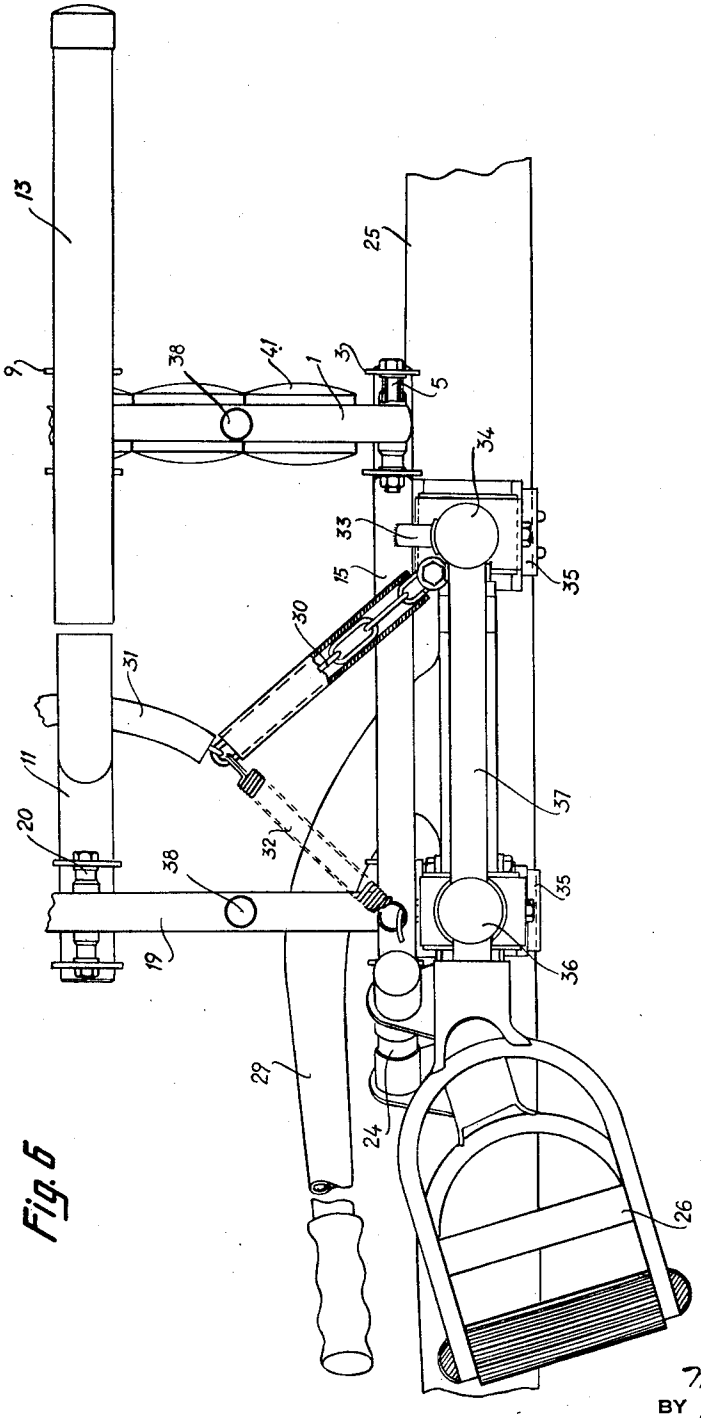

Fig. 6

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United States Patent Office 3,140,099 Patented July 7, 1964

3,140,099

SKI-TYPE BOB SLED

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Filed June 9, 1961, Ser. No. 115,983
2 Claims. (Cl. 280—16)

The present invention relates to a bob sled and more particularly to a bob sled which comprises either one or two pairs of interconnected skis.

The two skis of a pair are interconnected by a parallelogram linkage for simultaneous pivotal movement about their normally parallel spaced longitudinal axes. The skis may be pivoted in a horizontal plane for steering purposes. The parallelogram linkage is so connected to the operator's seat that lateral tilting of the skis may be controlled by a shifting of the body weight of the operator from side to side. This arrangement gives the sled an unusually high degree of maneuverability.

The invention will be more fully understood by a reading of the following specification, reference being had to the accompanying drawing forming a part hereof.

Referring to the drawing:

FIG. 1 is a diagrammatic representation of an embodiment of the invention utilizing a single pair of skis.

FIG. 2 is a diagrammatic representation, similar to FIG. 1, of another embodiment of the invention which utilizes two pairs of skis.

FIG. 3 is a perspective view of the arrangement which has two pairs of skis.

FIG. 4 is a perspective view of the embodiment with a single pair of skis.

FIG. 5 is a fragmentary side elevational view of the embodiment of FIG. 4.

FIG. 6 is a fragmentary plan view of the embodiment of FIG. 4.

Referring to FIG. 1, the parallelogram linkage comprises an upper transverse bar **1** and a lower transverse bar **2**. The upper and lower bars **1** and **2** are interconnected at one side of the sled by a vertically extending lateral bar **3** and at the other side by a vertical bar **4**. The ends of the bar **3** are connected to one end of each of the transverse bars **1** and **2** by upper and lower pivotal connections **5** and **6**, respectively. The ends of the lateral bar **4** are similarly connected to the bars **1** and **2** by pivotal connections **7** and **8**. The pivotal connections **5**, **6**, **7** and **8** permit movement about pivotal axes all of which are parallel to the longitudinal axis of the bob sled.

A central vertical bar **9** extends between the midpoints of the upper and lower transverse bars **1** and **2**, being connected thereto by pivotal connections **27** and **28**, respectively. The pivotal axes of connections **27** and **28** are parallel to the pivotal axes of connections **5**, **6**, **7** and **8**.

A horizontal frame member **11** is rigidly secured to the midpoint of vertical bar **9** as indicated at **10** by welding or other suitable means. The forward end of the frame member **11** is supported at the mid-point of a transverse bar **19** by a pivotal connection or bearing **20** which permits rotational movement of the frame member **11** along with the vertical bar **9**. The lower end of the upright portion of a saddle support **13** is rigidly secured to the frame member **11** intermediate the ends of the frame member. The upper free end portion of the saddle support **13** extends rearwardly and a saddle **14** is mounted thereon.

The longitudinally extending frame member **11** is flanked by two bifurcated frame members **15** and **16**, connected to **3** and **4** at **17** and **18**, respectively. The horizontally and forwardly extending terminal portions of the frame members **15** and **16** are journalled in pivotal connections **21** and **22**, respectively, which are carried by

the lateral extremities of the transverse bar **19**. The downwardly extending portions **23** of the bifurcated frame members **15** and **16** are each separately secured to one ski **25** of a pair of normally parallel skis. The pivotal connections indicated at **24** are described in greater detail below. For the purposes of FIG. 1, however, they may be considered as permitting pivotal movement of the skis **25** about a transverse axis passing through the points **24**. Lateral tilting movements of the skis about their longitudinal axes are caused by movements of the parallelogram linkage **1–4**. Displacements of the parallelogram linkage **1–4** are produced by shifting the weight of the passenger or rider laterally on the saddle **14** which, in turn, produces rotation of the frame member **11** and a corresponding rotation of the central vertical bar **9** about its midpoint.

Referring to FIGS. 4, 5 and 6, the side frame member **15**, at its forward end, carries a bearing **24** which permits steering movement of the ski **25**. The rotational axis of the bearing **24** is upwardly and rearwardly inclined so that turning of the ski in a horizontal plane is accompanied by a lateral tilting about its longitudinal axis. This tilting is independent of the tilting produced by the saddle **14** through the parallelogram linkage **1–4**. The direction of tilting produced by the steering bearing **24** is such that the ski **25** engages the snow to oppose the centrifugal force accompanying the turning movement of the vehicle.

A longitudinally extending horizontal bar **37** is connected at its forward end to the bearing **24**. Shock absorbers **34** and **36** are connected to the bar **37**. The lower ends of the shock absorbers **34** and **36** are connected to the ski **25** through connectors **35** which permit pivotal movement of each ski **25** about a transverse axis. Steering movement of the ski, which causes the front end of the ski to toe inwardly, may be produced by a stirrup **26** secured to the forward end of horizontal bar **37**. Alternatively, steering movement may be produced by means of a hand lever **29** which is rigidly connected to the ski **25** through the lower portions of the connectors **35**.

When one ski is toed inwardly for steering, or both skis are toed inwardly for braking, this movement is yieldingly opposed by helical tension springs **32** interconnected by chains **30** and **31**. Only one of the springs **32** and chains **30** is visible in FIG. 6. The resilient system **30–32** normally urges rear shock absorber **34** into lateral engagement with a stop or bumper member **33** fixed to the side frame member **15**, a similar bumper (not shown) being carried by the other side frame member **16**.

Sockets **38** are fixed to the upper linkage bar **1** and to the transverse bar **19**. A cover member **40** carries pegs **39** which are received in the sockets **38** so that the cover member **40** may be removed or replaced at will.

Circumferentially grooved cylindrical members **41** are retained in the linkage **1–4**. These members **41** are formed of resilient material and yieldingly urge the bars **1**, **2** into a perpendicular relationship with respect to the bars **3**, **4**.

In FIGS. 2 and 3 there is shown a modified embodiment of the invention wherein a pair of front skis **42** and a separate pair of rear skis **43** are provided. The two saddles **64** and **65** are mounted on a common longitudinal frame member **63** which controls the lateral tilting movements of both pairs of skis. The longitudinal frame member **63** extends between the midpoints of two vertical bars **63***a* and **63***b*. The upper and lower ends of the rear vertical bar **63***b* are secured by pivotal connections **67** and **66** to the upper and lower bars **48** and **46**, respectively, of the rear parallelogram linkage **46–48–70**.

The upper transverse bar of the linkage **46–48–70** is provided at its ends with pivotal connections **50** and **51**. The lower bar **46** is provided with pivotal connections **44** and **45** which secure the linkage **46–48–70** to the rear skis **43** so that the rear skis are constrained to tilt simul-

taneously in a lateral manner about their longitudinal axes while permitting free pivotal movement of each ski about a transverse axis. The stirrups **72** for the rear rider are pivotally connected at **73** to a depending lateral projection from the longitudinal frame member **63**. The stirrups **72** are rigidly held against rotational movement with respect to the longitudinal frame member **63** by a suitable system of mechanical connections **71** secured to the lower member **46** of the linkage **46–48–57**.

At the front of the sled, there is a parallelogram linkage **55–58** having pivotal axes of connection, **59**, **60**, **61**, **62**, akin to **5–8**. Universal joints **69x** and **69** control the attitude of linkage **55–58** in accordance with rotational movements of the longitudinal frame member **63**. For steering purposes, the forward pair of skis **42** is turned as a unit by a steering wheel **75**. The universal joints **69x** and **69** permit such movement while at the same time transmitting to the forward pair of skis **42** the tilted attitude which corresponds to that of the front and rear parallelogram linkages **55–58** and **46–48–57**. The combined tilting and steering movements are transmitted through suitable articulated joints **53** to the front skis **42** through rearwardly and upwardly inclined members **54** which cause supplementary lateral tilting movements of the front skis **42** to engage the snow in a manner which opposes the centrifugal force accompanying turning of the sled. Stirrups **52** are associated with the front skis as foot rests. A brake **12** is provided for operation by the rear rider.

In FIGURE 3 the numeral **74** designates a wind-shield.

While I have described what I believe to be the best embodiments of my invention, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A sled comprising:
a pair of skis,
parallelogrram linkage means interconnecting said skis,
resilient means acting on said linkage means and yieldingly urging said linkage means toward a predetermined normal attitude,
displacements of said linkage means from said normal attitude causing simultaneous lateral tilting movements of both skis in the same direction and through equal angles in unison about their respective individual longitudinal axes,
saddle means carried by said linkage means for support by said skis,
said tilting movement of said skis being produced by a lateral shifting of the body weight of a rider occupying said saddle means,
pedally actuable steering means for producing angular displacements of said skis in a horizontal plane independently of said lateral tilting movements,

said steering means comprising a pivotal connection between each ski and said linkage means,
the rotational axes of said pivotal connection being upwardly and rearwardly inclined,
said steering means permitting each ski to be individually toed in,
resilient means yieldingly urging said skis into parallel relationship, and stop means preventing toeing out displacements of said skis.

2. A sled comprising:
front and rear pairs of skis,
front parallelogram linkage means connected to said front pair of skis,
rear parallelogram linkage means connected to said rear pair of skis,
a longitudinally extending bar interconnecting said front and rear linkage means,
at least one saddle carried by said bar,
a lateral shifting of the weight of a rider occupying said saddle producing turning movements of said bar about its longitudinal axis accompanied by simultaneous displacements of said front and rear linkage means,
said displacements of said linkage means causing simultaneous lateral tilting displacements of all of said skis in unison each about its respective individual longitudinal axis,
steering means for turning said front skis as a unit in a horizontal plane,
said steering means comprising a pivotal connection between each ski and said linkage means,
the rotational axes of said pivotal connection being upwardly and rearwardly inclined,
said steering means permitting each ski to be individually toed in,
resilient means yieldingly urging said skis into parallel relationship, and
stop means preventing toeing out displacements of said skis.

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