Feb. 25, 1941. M. A. HOLBROOK 2,233,012

COASTING SLED

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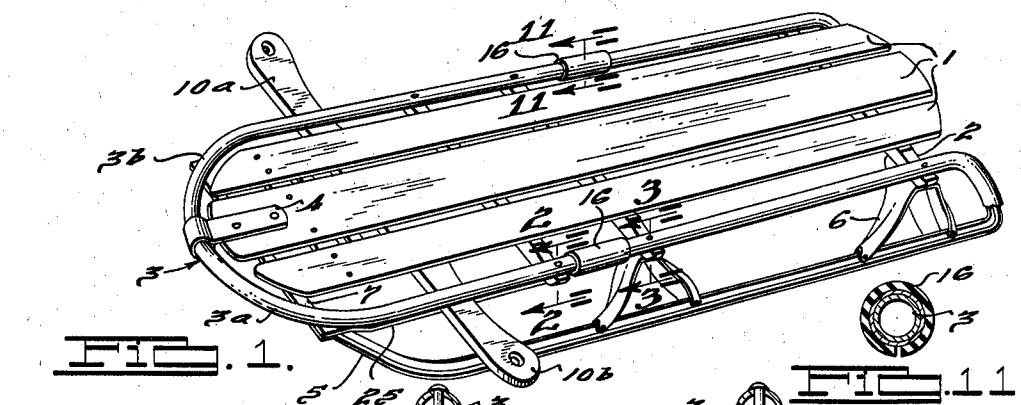


FIG. 1.

FIG. 11

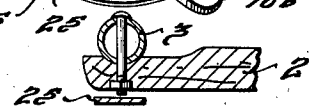


FIG. 2.

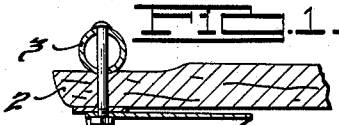


FIG. 3.

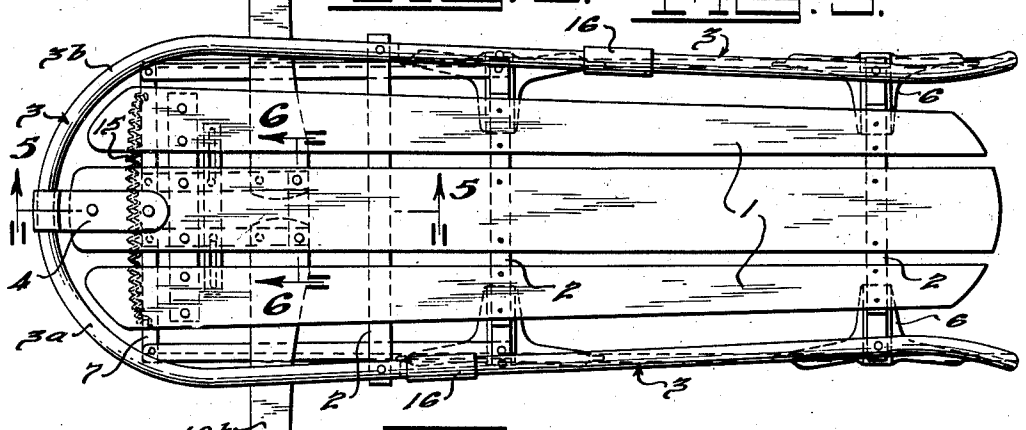


FIG. 4.

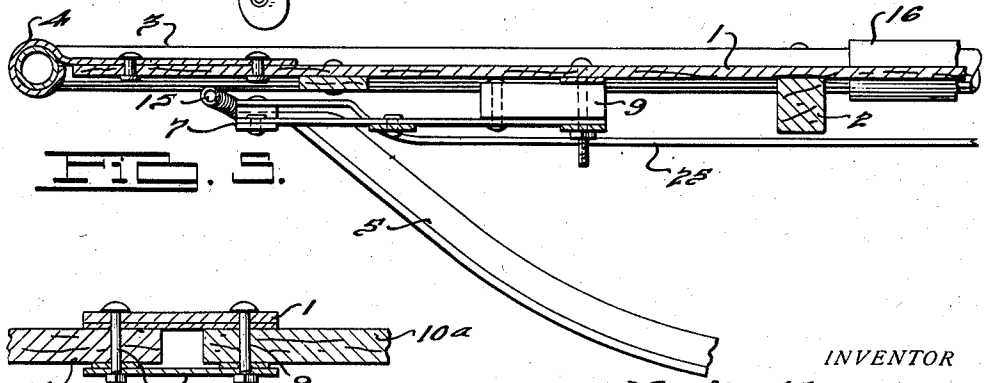


FIG. 5.

FIG. 6.

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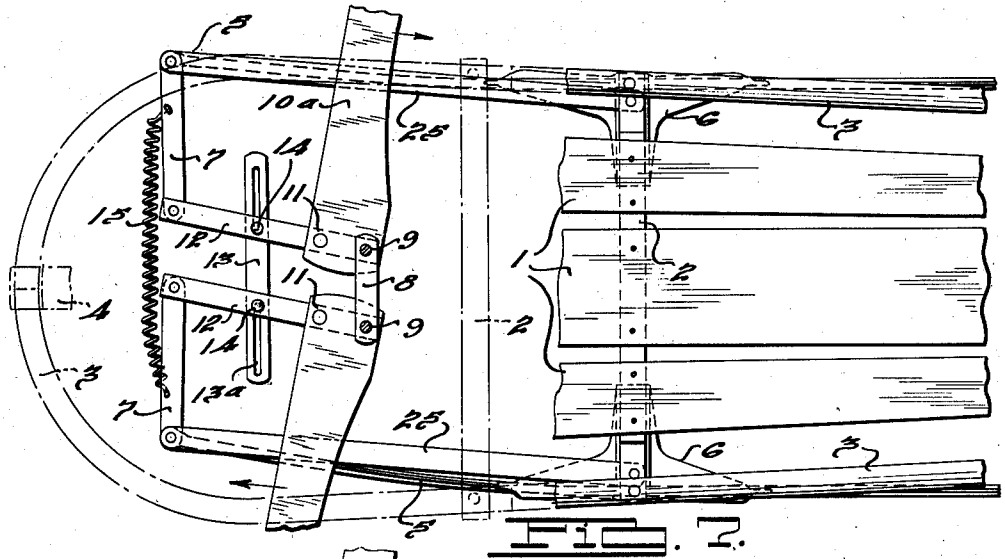


FIG. 7.

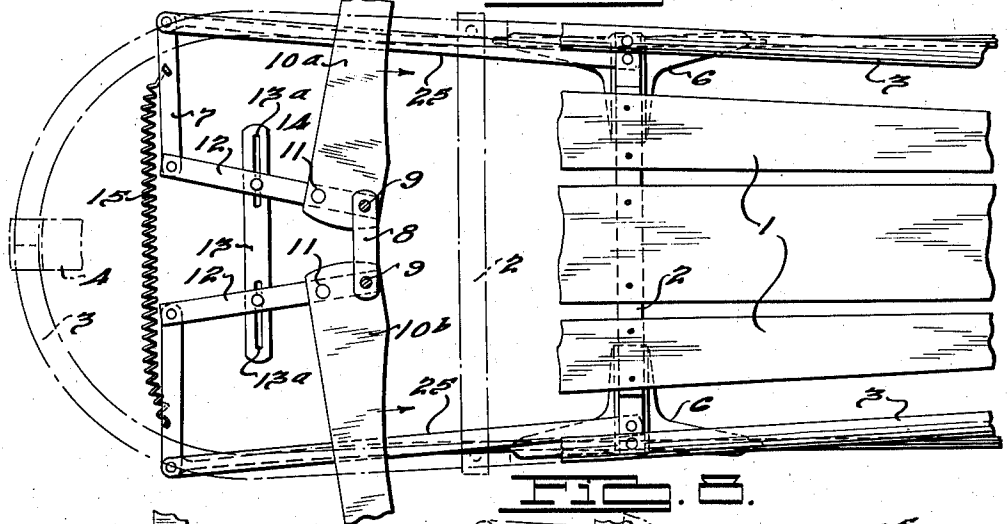


FIG. 8.

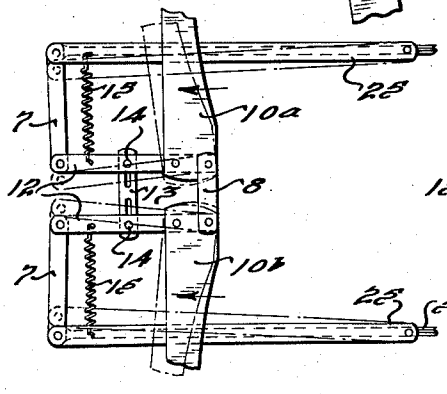


FIG. 9.

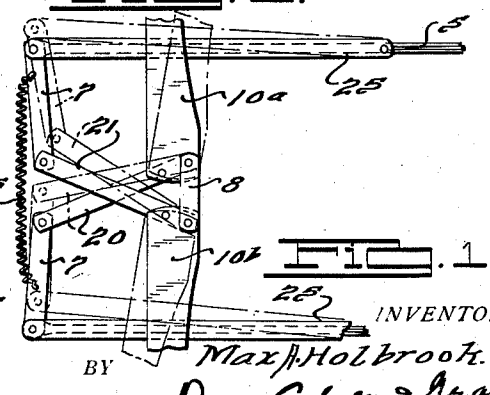


FIG. 10.

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Fig. 12.

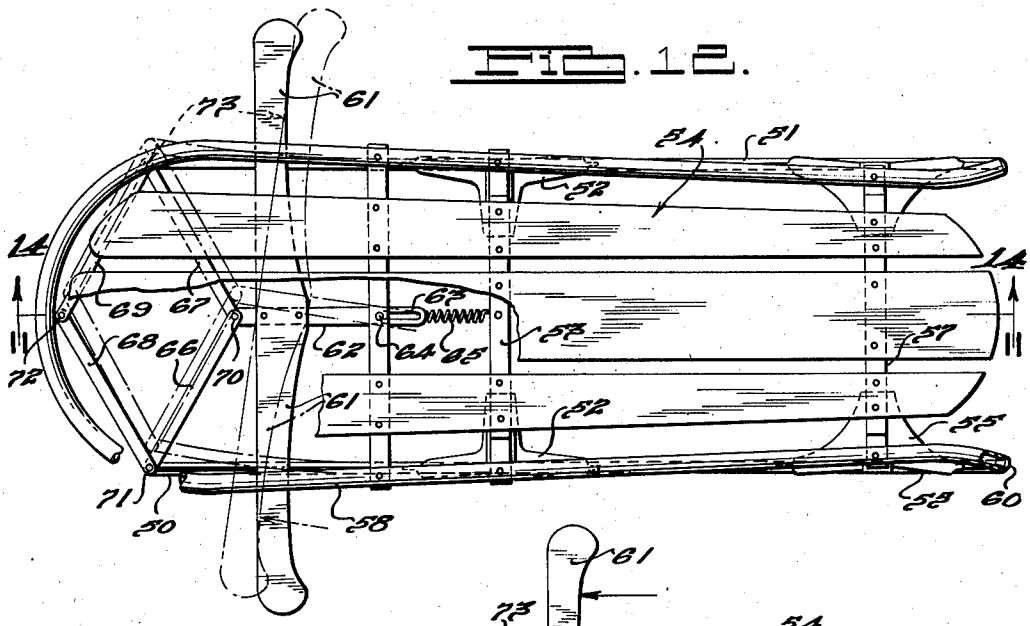


Fig. 13.

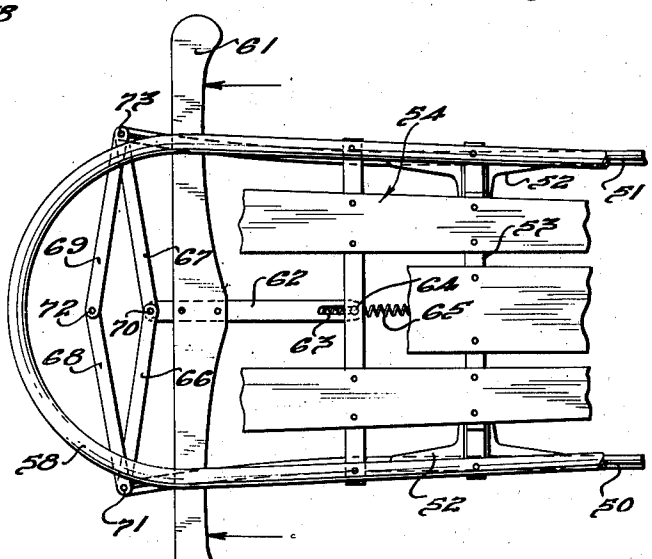
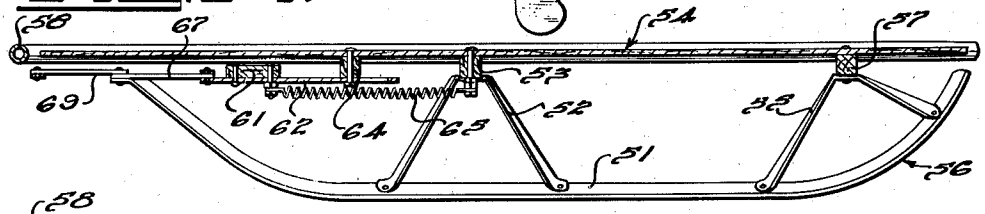


Fig. 14.



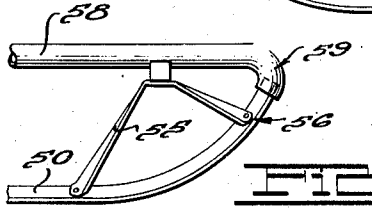


Fig. 15.

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2,233,012

COASTING SLED

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Application April 26, 1938, Serial No. 204,381

6 Claims. (Cl. 280—22)

The present invention relates to safety coasting sleds and particularly to such coasting sleds of the flexible runner type wherein flexing of the runners is utilized to secure a steering as well as a braking of the sled.

It is an object of the present invention to provide a safety sled of the flexible runner type in which a parallel flexing of the runners is utilized to control the direction of the sled and divergent flexing of the runners is utilized to retard the speed of the sled.

Another object of the present invention is to provide a safety coasting sled in which sharp horizontally extending rear ends of the runners are eliminated or protected thereby to avoid serious accidental injuries to the user.

A further object of the present invention is to provide a sled construction having an all metal top frame member of tubular steel or other strong metal which also serves as a bumper bar on the front and on both sides of the sled and which provides a sled structure which is safe and of durable construction as well as pleasing in appearance and in which provision is made to protect chilling or freezing of the hands of the user by the cold metal.

A still further object of the present invention is to provide a sled construction of improved coasting characteristics in which the rear ends of the runners are shaped to eliminate drag on the sled due to cutting of the surface of the coasting incline by exposed horizontally extending ends of the sled runners.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a view in perspective of a sled comprising a preferred embodiment of the present invention.

Figs. 2 and 3 are enlarged sections taken substantially on the lines 2—2 and 3—3, respectively, in the direction of the arrows of Fig. 1.

Fig. 4 is a top plan view of the sled construction shown in Fig. 1.

Fig. 5 is a fragmentary longitudinal section taken substantially on the line 5—5 of Fig. 4 in the direction of the arrows.

Fig. 6 is an enlarged section taken substantially on the line 6—6 of Fig. 4 in the direction of the arrows, showing a detail of the construction of the pivot system and lever systems utilized in the present invention.

Fig. 7 is a fragmentary elevation with parts broken away showing the forward structure of the sled shown in Fig. 1 and showing in particular one form of steering and braking control mechanism, the parts thereof being shown in position for directing the sled in a right curve.

Fig. 8 is a view similar to Fig. 7 but showing the control mechanism in position for exerting a braking action on the sled by spreading of the runners outwardly from their normally aligned parallel positions.

Fig. 9 is a fragmentary elevation of a modified control mechanism showing in the dotted lines the positions of the respective parts to exert a braking action on the sled by drawing the ends of the runners inwardly toward each other and out of their normal aligned parallel positions.

Fig. 10 is a fragmentary elevation showing in solid lines a modified form of steering and braking control system in a normal position. The dotted lines indicate a braking position in which the braking effort is applied by a deflection of the runners in a manner similar to that shown in Fig. 8.

Fig. 11 is a sectional view taken substantially on the line 11—11 of Fig. 1 in the direction of the arrows.

Fig. 12 is a top plan view with parts broken away showing a sled construction embodying a modified form of the present invention.

Fig. 13 is a fragmentary top plan view with parts broken away of the sled construction shown in Fig. 12 showing the position of the parts when the steering bar is moved to a braking position.

Fig. 14 is a sectional view taken substantially on the line 14—14 of Fig. 12 in the direction of the arrows.

Fig. 15 is a fragmentary elevation showing a form of runner guard construction which may be used in connection with a sled embodying the present invention.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

In one preferred embodiment of my present invention, shown here by way of example, the

sled body may comprise a platform 1 having the transverse bolsters 2 disposed beneath it at various points where required. The centerboard of the platform 1 projects forward to a point of attachment with a U-shaped bumper bar or frame member, shown as a whole at 3 and is secured thereto by any suitable means, as for example the clamp 4.

The U-shaped bar 3 may be formed from a single length of tubing or it may be formed from bent sections 3a and 3b. The bar 3 may if desired comprise merely a U shaped forward bumper portion having connections between the extending arms thereof and the side rails of conventional construction. If the U-shaped bar is formed of complemental parts 3a and 3b they are united during assembly of the sled so that the split between the ends of the sections is concealed by the clamp 4. The runners 5 are connected with the bolsters 2 by knees 6. The U-shaped bar 3 and the bolsters 2 are suitably connected at points of contact. The forward ends of the runners 5 are pivotally connected with one end of side links 25, the other ends of which are pivotally connected with the forward bolster 2. Any suitable means such as riveting or the like may be employed to secure the parts together in a rigid manner.

One construction of the rear section of the U-shaped bar 3 is shown in Fig. 1. As there shown, the ends of the bar 3 are bent downwardly until they meet and telescope over the upturned ends of the runners 5 and act as a guard or cover for the sharp ends of the runners.

The runners 5 at their forward ends are bent as shown in Fig. 5 and are pivotally attached to the drag links 7 which provide the means of connecting the steering and braking linkage with the forward ends of the runners.

The steering and braking mechanism in a preferred embodiment of the present invention may comprise steering arms 10a and 10b which are pivotally mounted as by the bolts 9 and plate 8 on the underside of the platform 1, as shown in Fig. 6. The separated steering arms 10a and 10b may pivot independently of each other relative to the bolts 9 and each serves as a lever in a train as illustrated in Figs. 7, 8, 9 and 10. Links 12 (Figs. 7 and 8) are rigidly secured to the steering arms 10a and 10b by rivets 11 and are secured against pivotal movement relative to the steering arms by connection with the bolts 9. This connection of the links 12 forms a bell crank lever, one arm of which is a steering arm and the other arm of which is a connecting link. This crank pivots about the bolt 9. The ends of the links 12 are pivotally connected with one end of the links 7, the other ends of which are pivotally connected with the ends of the runners 5.

A plate 13 is connected with links 12 and is slotted as at 13a. Depending pins 14 extend from the links 12 through the slots 13a to guide the links 12 and to limit movement thereof. The location of the slots 13a and positions of the pins 14a relative thereto control the braking action caused by movement of the steering arms. The plate 13 also functions to aid in steering for if but one arm, as for example arm 10a, is pulled, the rivet 14 would be at the end of the slot 13a and thus the lever 12b would tend to be pulled, also thus aiding in securing a parallel deflection of both runners though only one handlebar be actuated.

It is to be understood that the length of the slot 13a, the length of the plate 13, and especially the relative position of the rivet 14 in this slot, determine which way braking is opposed, if any, by the plate 13. If the slot is long and the rivet in the middle, as shown in Fig. 8, the plate would have little effect upon steering or braking and serve solely as an aid to the link 12 in conveying the thrust. If the plate were extended and the rivet 14 placed near the opposite end of the slot from that shown in Fig. 9, then braking could be accomplished only by pushing on both steering arms. In this situation, if one steering arm were pushed it would tend to aid steering in the direction in which that force tended to cause the sled to take, instead of an aid to steering if the steering arm were pulled as shown in Fig. 9 and as explained above.

Suitable springs 15, as for example coil springs, are connected with some part of the train of levers and assist in returning the parts to their positions to secure the parallel aligned position of the runners. The resiliency of the runners tends to cause such a return but is assisted by the action of the springs 15. Two suggested positions for the springs 15 are shown in Figs. 8 and 9 and the selection of the positions is controlled by the desired action of the parts to secure the braking action on the motion of the sled.

When the steering arms 10a or 10b are moved as shown in Fig. 7, the links 12 are moved clockwise about the bolts 9. This imparts movement to the links 7 which is transferred to the runners 5 attached thereto. This causes parallel flexing of the runners as shown by the dotted lines of Fig. 7 and provides a directional control of the sled. In Fig. 7 the parts are shown in their respective positions to steer the sled to the right. It is obvious that a curve to the left may be effected by pulling on the handlebar 10b and pushing the handlebar 10a which sets up like forces to those just described but in an opposite direction to effect a parallel flexing of the runners 5 to the left.

The speed of the sled may be retarded by flexing the runners 5 in such a manner as to throw the runners out of parallel alignment by operating the steering arms 10a and 10b in opposite directions, that is, one arm being moved clockwise relative to its connection with the bolt 9 and the other being moved counterclockwise relative to its connection with the bolt 9. Such movement occurs whenever the ends of both arms are simultaneously pulled toward the rear of the sled. The position of the parts and action of the linkages under such conditions are illustrated in Fig. 8. As there shown, it will be seen that the ends of the runners 5 are spread and thrown out of parallel alignment and set up both a left and a right sideward thrust. This causes a retardation of the motion of the sled and exerts a braking of the sled.

If it is desired to exert a braking action by pushing both steering arms, the ends of the runners may be pulled toward each other and similar braking effect is achieved. The latter position is clearly illustrated by Fig. 9. In either instance, the steering arms initiate and control the braking action but the motion of the sled further assists the action as the side forces exerted on the misaligned runners tend to push the runners to the extreme braking positions.

The particular lever systems described herein are not the only systems which will function as herein described. The systems shown and described have been selected merely as typical examples

and many variations are possible within the scope of the present invention. A modification of such structure is illustrated in Fig. 10. As there shown, this comprises crossed links 20 and 21 secured at one end to the drag links 7 and at the other to the handlebars 10a and 10b. The motion of the handlebars 10a and 10b simultaneously in the same direction will throw the runners into a misaligned position which will cause braking of the motion of the sled. Movement of the bars 10a and 10b in opposite directions will cause flexing of the runners on substantially parallel lines to effect steering of the sled.

In order to preserve the surface of the bar 3 and also to prevent freezing of the hands of the user to the metal in the bar 3, in one embodiment of my invention I propose to use a thick cellulosic coating of the type known commercially as "Macoid." Such a coating is a heat insulating covering and prevents the freezing of the skin of the user to the metal surface of the bar 3. If desired, the bar 3 may be provided with an ornamental and protective covering of metal, such for example as chromium, nickel, and the like. In this instance, I propose to utilize hand grips 16 as shown in Figs. 1 and 11. These grips 16 may be made of any suitable heat insulating material, such for example as rubber, cork, plastic, or the like. The grips 16 preferably encircle the U-bar 3, as shown in Fig. 11. These grips are held by frictional contact with the surface of the bar 3 and may be moved into various locations as shown in Figs. 1 and 2.

In the embodiment of the invention shown in Figs. 12 to 15, inclusive, I have shown a modified form of steering and braking control mechanism applied to a sled construction embodying novel features of safety construction. As here shown, such a sled may comprise a pair of flexible runners 50 and 51 normally maintained in substantially parallel alignment. Each runner is secured to a knee 52 which has arms of substantially equal lengths and which is secured to the cross sill 53 forming a part of the top member 54. A knee 55, having arms of different lengths, is connected as shown in Fig. 14 to the runners at a point adjacent the rear ends thereof. The rear end of each runner is turned upwardly to form a curved section 56 which is connected with the knee 55. The knee 55 is secured to a cross sill 57 forming a part of the top member 54. The end of the curved portion 56 of the runners terminates adjacent the underside of a bumper bar and side rail member 58 in such a manner that the possibility of accidental injury on the sharp end portion is eliminated. If desired, the end of the side rail may be turned downwardly at 59 as shown in Fig. 15 and telescope over the end of runner 51. In forming the bumper bar and side rails 58 of tubular metal stock as shown in Fig. 12, it is desirable to provide a stop 60 in each open end portion, thereby to cover a sharp edge otherwise present thereon and to prevent the freezing of water inside the tubular members.

The steering and braking action of the sled construction shown in Figs. 12 to 14 is controlled from a steer bar 61 which is movable bodily in a horizontal plane relative to the top member 54 from the position shown in Fig. 12 to the position shown in Fig. 13 to effect a braking action on the sled, and which is pivotally movable to the dotted line position shown in Fig. 12 to effect steering of the sled.

The steer bar 61 is rigidly connected to a guide member 62 having a slot 63 which engages a depending pin 64 carried by the top member 54. The pin 64 is headed as shown in Fig. 14 and supports the guide member 62 against vertical displacement relative thereto. A spring 65 is connected at one end with the cross sill 53 and at the other end with the guide member 62 and normally maintains the guide member and the steering bar 61 in the normal steering position shown in Fig. 12. The movement of the steering bar 61 to the braking position shown in Fig. 13 is accomplished by stretching the spring 65 so that upon release of the displacing force on the bar 61, it returns to the position shown in Fig. 12.

The forward end of the guide member 61 is pivotally connected with levers 66 and 67 which in turn are pivotally connected with levers 68 and 69 to form a parallelogram having pivotal connnections 70, 71, 72 and 73. At the points 71 and 73, the parallelogram is pivotally connected with the forward ends of the runners 50 and 51.

During the steering of the sled as shown by the dotted line in Fig. 12, the parallelogram is moved bodily to effect a parallel flexing of the ends of the runners 50 and 51 by a pivotal movement of the steer bar 61. Upon horizontal movement of the steer bar 61 as shown in Fig. 13, the pivots 70 and 72 of the parallelogram are brought closer together and the points 71 and 73 are pushed further apart. This results in spreading the ends of the runners 50 and 51 in divergent directions which exerts a braking effect on the motion of the sled. It is to be noted that when the runners are in the braking position as shown in Fig. 13, pivotal movement of the steer bar 61 will also permit flexing of the runners to allow steering control as well.

It is to be understood that with slight modifications within the purview of a mechanic skilled in the art, the linkages here described may be changed within the scope of the present invention to pull the ends of the runners 50 and 51 toward each other and thus by changing the normally parallel alignment of the runners exert a braking effect on the motion of the sled.

It has been noted that the provision of the curved portion 56 on the rear ends of the runners increases the normal speed of the sled when travelling down an incline as it prevents the rear ends of the runners from cutting into the surface thereof as is often the case when the rear ends of the runners lie in substantially the same horizontal plane as the rest of the runners.

I claim:

1. A sled comprising a pair of normally alined parallel runners having flexible forward end portions, a top member secured to and supported on said runners, a substantially U-shaped frame comprising a formed tubular member secured to said top member and having its terminal end portions bent downwardly and telescoped over the ends of said runners, and a control mechanism to control flexing of the forward ends of said runners, said control mechanism being adapted to selectively control the speed and direction of the sled by flexing of said runners.

2. A sled comprising a pair of normally alined parallel runners having flexible forward end portions, a top member secured to and supported on said runners, a frame of substantially U-shape comprising a formed tubular member secured to said top member and having its terminal end portions bent downwardly and telescoped over the ends of said runners, a control mechanism to control flexing of the forward

ends of said runners, said control mechanism being adapted to selectively control the speed and direction of the sled by flexing of said runners, and spring means adapted to urge the return of said control mechanism and runners to the normal alined position.

3. A safety sled construction comprising a pair of flexible runners connected with a top member, both ends of said runners having upwardly turned arcuate portions terminating adjacent the top member whereby the end portions of both runners are disposed beneath and shielded by a portion of said top member.

4. A coasting sled comprising a pair of flexible runners having upwardly turned ends secured in substantially parallel alignment to a top member, and knees connecting said top member and said runners, the knee adjacent the upwardly turned rear end of each of said runners having arm portions of unequal length, the longer being connected with the horizontal portion of said runner and the shorter being connected with the upwardly turned portion thereof lying in a plane above the horizontal plane.

5. A sled comprising a pair of normally alined parallel runners having flexible forward end portions and upturned rear end portions, a top member secured to and supported on said runners, a substantially U-shaped frame comprising a formed tubular member secured to said top member and having downwardly bent terminal end portions telescoped over the upturned rear end portions of said runners, and a control mechanism to control flexing of the forward ends of said runners.

6. A steerable sled comprising a pair of normally alined parallel runners having flexible forward end portions, a top member secured to and supported on said runners, a substantially U-shaped frame comprising a formed tubular member secured to said top member and having its terminal end portions bent downwardly and telescoped over the ends of said runners, and a heat insulating protective covering on said substantially U-shaped frame.

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