

June 14, 1949.

R. G. PEENSTRA

2,472,920

FOLDING SLED

Filed Dec. 15, 1947

2 Sheets-Sheet 1

Fig. 1.

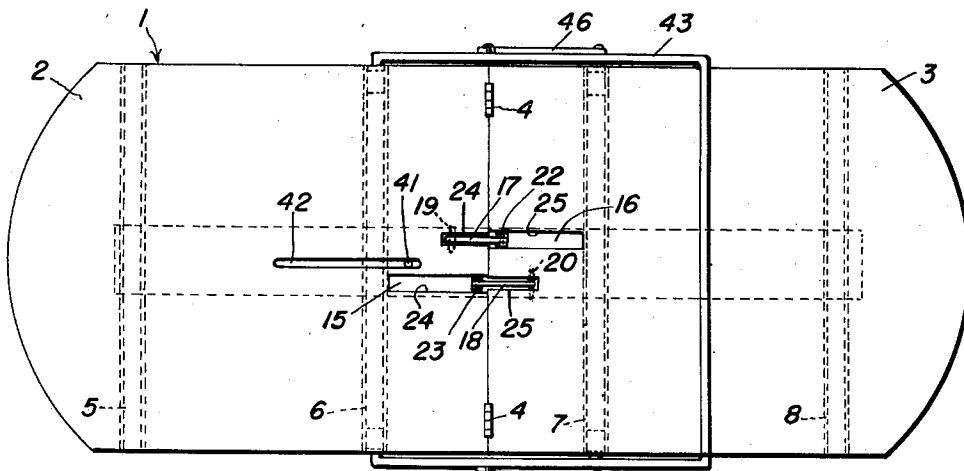


Fig. 2.

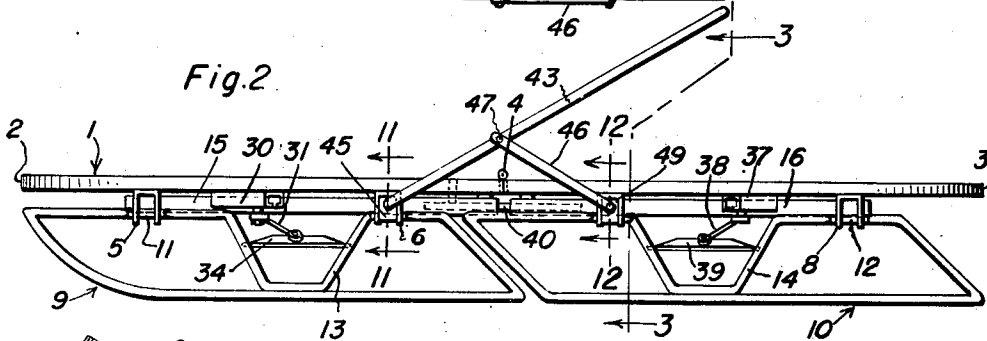


Fig. 6.

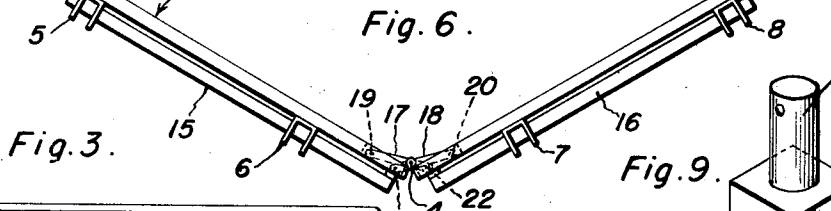


Fig. 3.

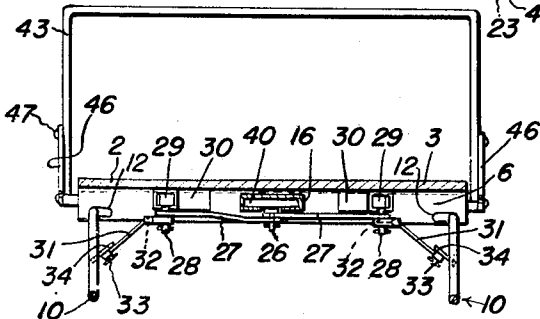
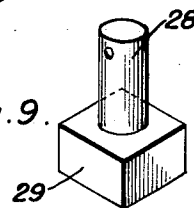


Fig. 9.



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Fig. 5.

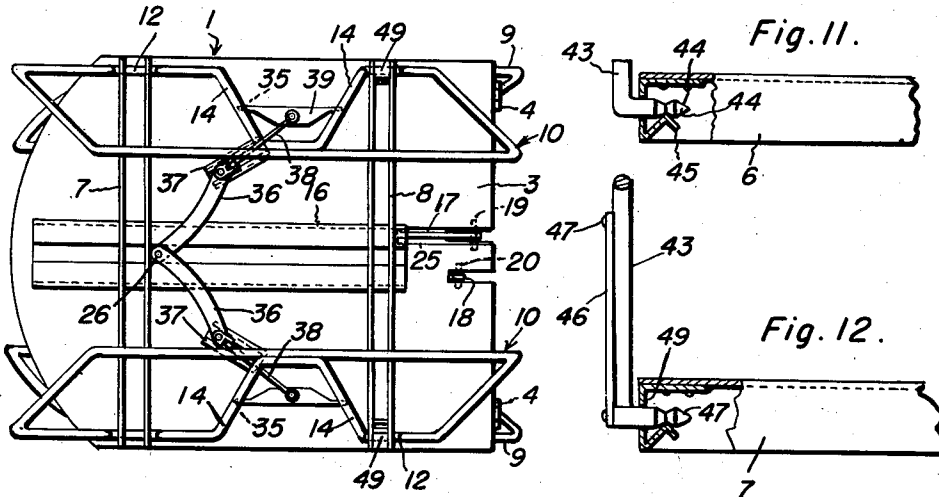


Fig. 4.

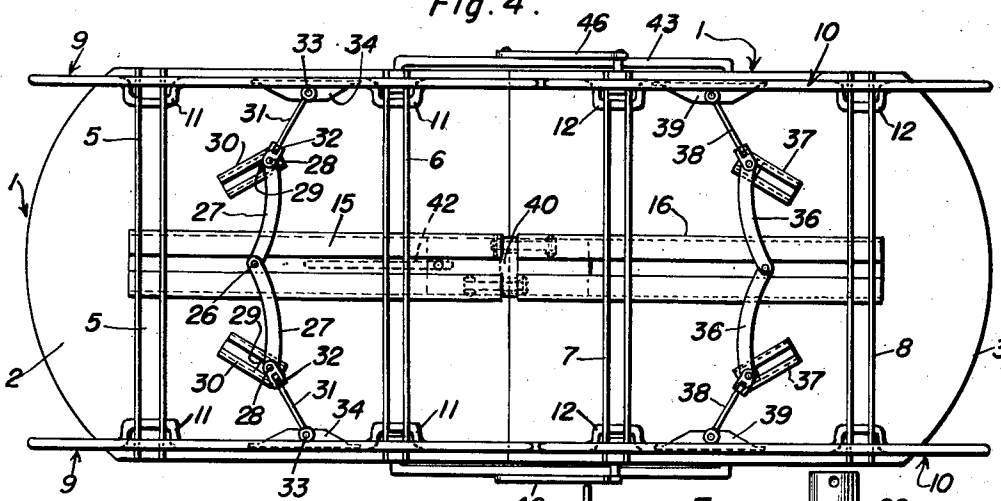
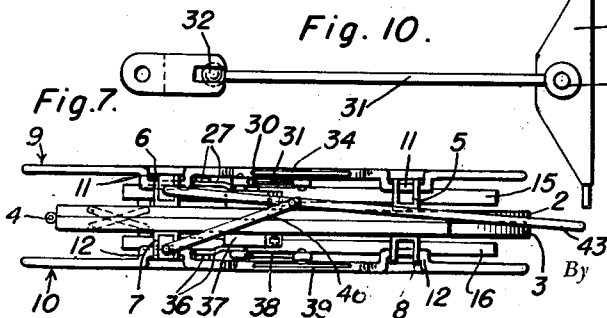


Fig. 10.

Fig. 8.



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UNITED STATES PATENT OFFICE

2,472,920

FOLDING SLED

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Application December 15, 1947, Serial No. 791,687

6 Claims. (Cl. 280—20)

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My invention relates to improvements in folding sleds for children, the principal object in view being to provide a sled with a back rest, and which is adapted to be folded in substantially one operation compactly into flat form for easy carrying and convenient storage in a small space.

Another object is to provide a sled foldable as above set forth which is strong, yet light in weight, involves few parts, and is inexpensive to manufacture.

Other and subordinate objects, within the purview of my invention, together with the precise nature of my improvements, will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in plan of my improved sled in a preferred embodiment thereof, unfolded;

Figure 2 is a view in side elevation;

Figure 3 is a view in transverse section taken on a line 3—3 of Figure 2;

Figure 4 is a view in bottom plan;

Figure 5 is a similar view of the sled folded with the rear section over the front section;

Figure 6 is a detailed view in side elevation with the runners eliminated and illustrating the manner in which the front and rear sections fold;

Figure 7 is a view in side elevation of the sled folded with the front section over the rear section;

Figure 8 is a view in perspective of one of the guide bars drawn to a larger scale;

Figure 9 is a view in perspective of one of the slide blocks drawn to a larger scale;

Figure 10 is a view in top elevation of one of the link rods and rocker bars drawn to a larger scale;

Figure 11 is a detail view in vertical section taken on the line 11—11 of Figure 2 and drawn to a larger scale;

Figure 12 is a similar view taken on the line 12—12 of Figure 2.

Referring to the drawings, by numerals, my improved sled, as shown, comprises an elongated, platform, body 1 divided in the transverse center thereof into a pair of front and rear half sections 2, 3 hinged together, as at 4, for folding upwardly into engaging parallel relation. A pair of front and rear transverse cleats 5, 6 suitably secured on the bottom of the section 2, and a similar pair of cleats 7, 8 suitably secured on the bottom of the rear section 3 brace said sections. Preferably the cleats 5, 6, 7, 8 are of channel iron

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form for lightness and strength. The body 1 may be formed of any desired light, strong material.

Front and rear pairs of runners 9, 10 are provided for the front and rear sections 2, 3 and are mounted at opposite sides of said sections 2, 3 for folding inwardly close to said sections substantially parallel therewith, as presently described.

The pairs of runners 9, 10 have the form of elongated, open frames, preferably of rod-like material, each with a pair of lateral right-angled U-shaped cranks in the upper side thereof designated 11 in the case of the front pair of runners 9 and 12 in the case of the rear pair 10. The cranks 11 of the front pair of runners 9 straddle the cleats 5, 6 and are journaled therein, near the ends of said cleats, and the cranks 12 of the rear pair of runners 10 straddle the cleats 7, 8 and are also journaled therein near the ends thereof so that the runners 9, 10 when unfolded are journaled to swing on said cleats about axes parallel with the sides of said sections 2, 3 and are adapted to unfold with the cranks 11, 12 substantially horizontal, whereby weight on the runners 9, 10 tends to maintain the same unfolded. The front pair of runners 9 are each provided with a U-bend 13 in substantially the transverse center thereof and in the upper side of the same, in the plane of the runner, and the rear pair of runners 10 are each provided with a similar bend 14. The bends 13 are located between the pair of cleats 5, 6 of the section 2, the bends 14 between the pair of cleats 7, 8 of the rear section 3. Said U-bends 13, 14 serve a particular purpose presently seen.

Means are provided for folding the front and rear pairs of runners 9, 10 operative by folding of the sections 2, 3, and now to be described.

In the longitudinal center of the sections 2, 3 is a pair of elongated, front and rear slides 15, 16 spaced apart end to end with each of said sections upon opposite sides of the axis of folding movement of said sections, the front slide 15 being slidably extended through the pair of cleats 5, 6 on the front section 2, and the rear slide 16 being similarly extended through the cleats 7, 8 on the rear section 3, said slides 15, 16 being endwise slidable longitudinally of said sections and formed of C-shape, substantially, in cross section for a purpose presently apparent.

A pair of flat links 17, 18 are pivoted at one end, respectively, to the front and rear sections 2, 3, as at 19, 20 upon opposite sides of the axis of folding movement of said sections 2, 3 with their other ends pivoted, as at 22, 23 to the inner ends of said slides 15, 16, said links 17, 18 working in longitudinal slots 24, 25 in said sections 2, 3

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aligned in pairs as best shown in Figure 1. As best shown in Figure 6, the arrangement of the links 17, 18 is such that while said sections 2, 3 are being folded, said links slide the slide 15 forwardly of the section 2 and the slide 16 rearwardly of the section 3.

The front slide 15 has pivoted thereto, as at 26, overlapping inner ends of a pair of toggle links 27 having outer ends pivoted on pins 28 on slide blocks 29 slidably fitted in guide bars 30 substantially C-shaped in cross section and fixed to the front section 2 upon opposite sides of the front slide 15 in forwardly converging relation so that when said slide 15 is slid forwardly, by complete folding of the sections 2, 3, said guide blocks 29 will be cammed inwardly toward the slide 15, in other words, toward the longitudinal center of the section 2. A pair of link rods 31 are swivelled at one end on the pivot pins 28, as at 32, with the other ends thereof pivoted, as at 23, to a pair of rocker bars 34, pivoted, as at 35, in opposite sides of the U-bends 13 of the pair of front runners 9, the link rods 31 acting when the toggle links 27 are cammed toward said front slide 15 to pull on and fold said front pair of runners 9 substantially parallel with the folded section 2 as shown, in connection with one of each pair of said runners in Figure 7.

The rear slide 16 when moved rearwardly acts to fold the rear pair of runners 10, during complete folding of the section 3, in the same manner as described with reference to the pair of front runners 9, and through a pair of toggle links 36, guide bars 37, link rods 38, and rocker bars 39 in the bends 14 of said rear runners, in other words, through means duplicating that described as operated by the front slide 15, with the exception that the guide bars 37 converge rearwardly of the rear section 3 for camming purposes, to fold the pair of rear runners 10 as shown in connection with one of the same in Figure 5.

As will be clear, when the sections 2, 3 are unfolded, the front and rear slides 15, 16 are moved rearwardly and forwardly of said sections, respectively, by the links 17, 18 and are held by said links 17, 18 in a normal unfolded position in which the pairs of toggle links 27, 36 are straightened out to exert a thrust on the pairs of link rods 31, 38 and unfold the front and rear pair of runners 9, 10.

To prevent the sections 2, 3 of the body 1 from buckling on the hinges 4, when unfolded, a locking bar 40 is slidably fitted in the front and rear slides 15, 16 to bridge the inner ends thereof. A knob 41 on said bar 40 extending upwardly into a longitudinal slot 42 in the front section 2 is provided for sliding said bar 40 into and out of bridging relation to said slides 15, 16, to thereby unlock and lock said sections 2, 3 in a manner which will be clear.

A U-shaped back rest 43 of resilient rod-like material straddles the body 1 to incline upwardly and rearwardly thereof. Arrowhead ends 44 on said back rest 43 are adapted to snap into suitably apertured spring clips 45 on the ends of the transverse cleat 6 on the front section 2, to pivotally anchor said ends 44 to said cleat, said ends 44 being adapted to snap out of said clips 45 when the sides of said back rest 43 are pulled outwardly, whereby said back rest may be detached from said cleat 6. A pair of support bars 46 are pivoted, as at 47, to the sides of the back rest 43 to incline downwardly and rearwardly therefrom with lower arrowhead ends 48 adapted to snap into spring clips 49 on the ends of the front transverse cleat

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7 on the rear section 3, whereby to attach said bars 46 to said cleat, said ends 48 being adapted to be snapped out of the clips 49 when said support bars 46 are pulled outwardly so that said support bars may be detached from said cleat 7.

As will be seen, with the locking slide bar 40 slid, in the manner described, to unlock the front and rear slides 15, 16 and thereby unlock the front and rear sections 2, 3 of the body 1, said sections 2, 3 may be folded on the hinges 4 into engaging parallel relation, complete folding of said sections 2, 3 causing folding of the front and rear pairs of runners 9, 10 in the manner already described. In thus folding these parts the back rest 43 may be used to accomplish the folding by grasping the same with one hand and the front end of the section 2 with the other hand then swinging said section 2 and back rest 43 toward each other until the back rest is folded close to said section 2, as shown in Figure 7. In this folding of the back rest 43 the support bars 46 will be folded, in a manner which will be clear from Figure 7, to fold the section 3 in the manner described. As will be seen, in its folded position, the back rest 43 may be used as a handle for conveniently carrying the folded sled. The manner in which the described sled is unfolded, with the back rest 43 and support bars 46 attached will be readily understood from the foregoing description and, therefore, requires no further explanation.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention, without further explanation.

Manifestly, the invention, as described, is susceptible of modifications without departing from the inventive concept, and right is herewith reserved to such modifications as fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a sled of the class described, an elongated platform body comprising a pair of front and rear half sections, respectively, hinged together to be folded into engaging parallel relation, front and rear pairs of side runners for said front and rear sections swingably mounted thereon to fold toward the same substantially parallel therewith, and means operative by such folding of said sections to fold said pairs of runners.

2. In a sled of the class described, an elongated platform body comprising a pair of front and rear half sections, respectively, hinged together to be folded into engaging parallel relation, front and rear pairs of side runners for said front and rear sections swingably mounted thereon to fold toward the same substantially parallel therewith, a pair of slides on the bottoms of said sections, means operative by folding of said sections to cause sliding movement of said slides, and means operative by sliding movement of said slides to swing said pairs of runners into folded position.

3. In a sled of the class described, an elongated platform body comprising a pair of front and rear half sections, respectively, hinged together to be folded into engaging parallel relation, front and rear pairs of side runners for said front and rear sections swingably mounted thereon to fold toward the same substantially parallel therewith, means operative by such folding of said sections to fold said pairs of runners, and a back rest pivotally attached to said sections for swinging relative thereto to cause folding of said sections.

4. In a sled of the class described, an elongated platform body comprising a pair of front and

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rear half sections, respectively, hinged together to be folded into engaging parallel relation, front and rear pairs of side runners for said front and rear sections swingably mounted thereon to fold toward the same substantially parallel therewith, a pair of slides on the bottoms of said sections, means operative by folding of said sections to cause sliding movement of said slides, means operative by sliding movement of said slides to swing said pairs of runners into folded position, said slides swinging with said sections when said sections are being folded, and means for preventing said slides from swinging and thereby locking said sections against being folded.

5. In a sled of the class described, an elongated platform body comprising a pair of front and rear half sections, respectively, hinged together to be folded into engaging parallel relation, front and rear pairs of side runners for said front and rear sections swingably mounted thereon to fold toward the same substantially parallel therewith, a pair of slides on the bottoms of said sections, means operative by folding of said sections to

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cause sliding movement of said slides, and means operative by sliding movement of said slides to swing said pairs of runners into folded position including pairs of toggle links connecting said slides to said pairs of runners.

6. In a sled of the class described, having an elongated body comprising half sections hinged together to be folded into parallel relation, side runners for said sections swingably mounted thereon to fold toward the same substantially parallel therewith, and means operative by such folding of said sections to fold said runners.

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The following references are of record in the file of this patent:

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