Student Handout 2-Allen Sled Patent

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(No Model.) 2 Sheets—Sheet 1.

S. L. ALLEN.

SLED.

No. 408,681. Patented Aug. 13, 1889.

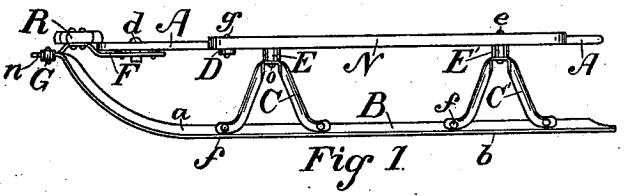

Fig. 1.

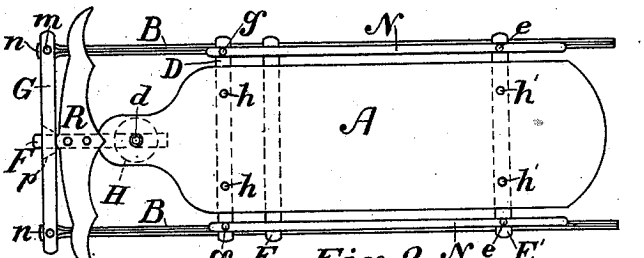

Fig. 2.

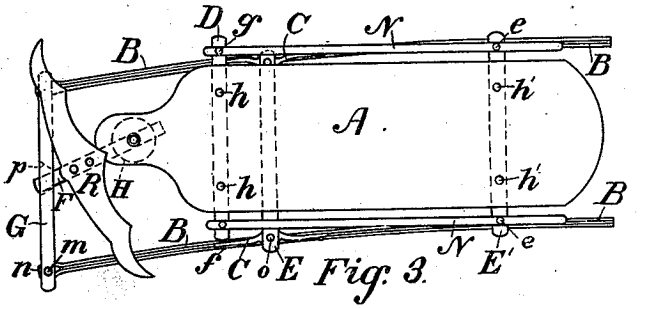

Fig. 3.

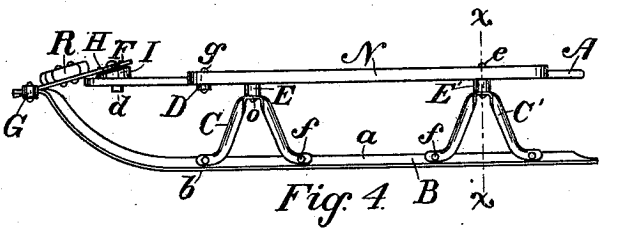

Fig. 4.

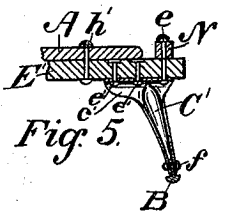

Fig. 5.

Fig. 7.

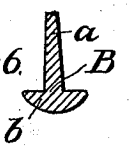

Fig. 6.

Witnesses
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W. H. Thompson.

Inventor
Sam L. Allen
By his Attorney
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(No Model.) 2 Sheets—Sheet 2.

S. L. ALLEN.

SLED.

No. 408,681. Patented Aug. 13, 1889.

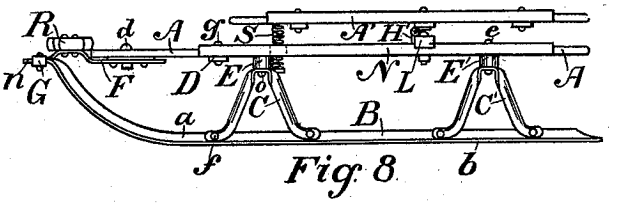

Fig. 8.

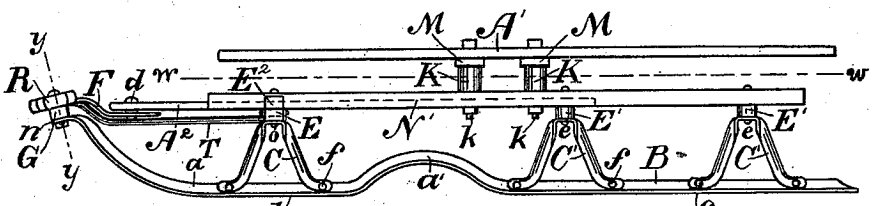

Fig. 9.

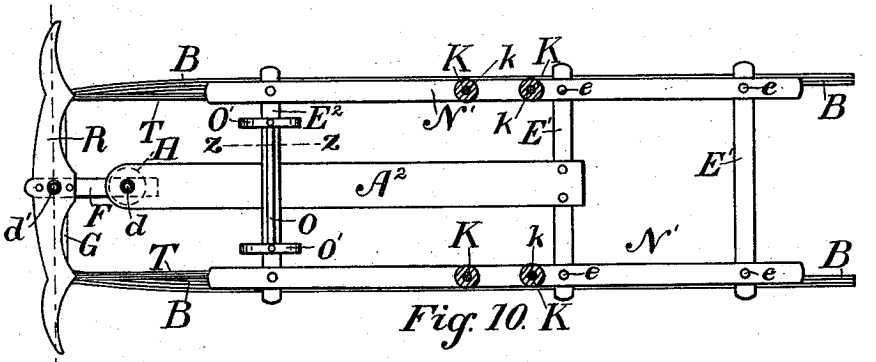

Fig. 10.

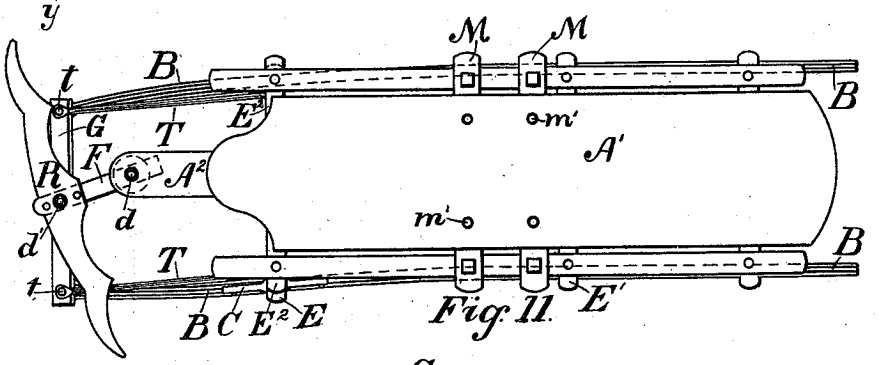

Fig. 11.

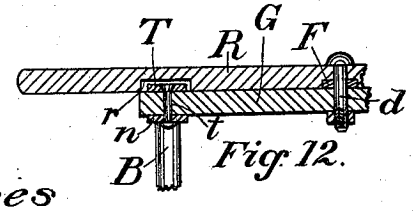

Fig. 12.

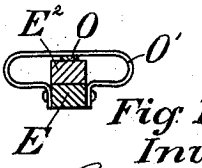

Fig. 13.

Witnesses
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Inventor
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Courtesy of the United States Patent and Trademark Office

UNITED STATES PATENT OFFICE.

SAMUEL L. ALLEN, OF CINNAMINSON, NEW JERSEY.

SLED.

SPECIFICATION forming part of Letters Patent No. 408,681, dated August 13, 1889.

Application filed February 14, 1889. Serial No. 299,864. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. ALLEN, a citizen of the United States, residing at Cinnaminson, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Sleds, of which the following is a full specification.

Referring to the accompanying drawings, Figure 1 is a side elevation of a sled embodying my invention. Figs. 2 and 3 are plan views of the same, showing the runners in straight and curved positions, respectively. Fig. 4 is a side view of a sled with a modified form of steering device. Fig. 5 is a section on *x x*, Fig. 4, on a somewhat larger scale. Fig. 6 is a sectional view of the runner. Fig. 7 shows the slotted runner connecting-bar. Fig. 8 shows in side elevation a sled fitted with a detachable spring-seat. Fig. 9 is a side view of a modified form of sled. Fig. 10 is a sectional plan on *w w*, Fig. 9, with the runners in a straight position. Fig. 11 is a plan view of the same with runners bent for steering. Fig. 12 is a section on *y y*, Figs. 9 and 10; and Fig. 13 is a section on *z z*, Fig. 10.

My invention consists of an improved sled embodying certain novel features of construction, the details of which are hereinafter fully described, and wherein the steering is accomplished by the lateral bending of the runners.

B B are the runners of my improved sled, constructed of any desired elastic material and made in such a form as to be capable of being bent sidewise, and preferably capable also of instantly regaining their normal position when the bending pressure is removed. I prefer to construct the runners each in one piece of steel rolled in the shape shown in the drawings, preferably T-shaped in cross-section.

The body of the sled is supported by two or more standards C C′, secured to each of the runners. These standards, as shown, are made of struck-up metal and bent around at their lower ends, as shown in Figs. 1, 3, and 5, to embrace the upright portion *a* of the runners B, to which they are riveted, and having flattened tops, through which they are screwed, bolted, or riveted to the cross-benches E E′, though any form of standard may obviously be used. The runners, benches, and standards attached thereto constitute, with the connecting-bar G, what might be termed the "runner-frame."

Referring to the form of sled shown in Figs. 1 and 8, inclusive, the seat A and the side or handle bars N are bolted or screwed directly to the rear cross-bench E′, as by means of the bolts *h′ e*, but simply rest upon the forward cross-bench E and are not fastened thereto, the forward ends of the side bars being secured to the seat by means of the cleat D. The seat and side bars together constitute the body in this case, though the side bars may of course be omitted. The rear standards C′ are rigidly secured to the rear cross-bench E′, as shown in Fig. 5, by two or more bolts or rivets; but I preferably secure the forward standards C to the forward cross-bench E each by a single screw, bolt, or rivet *o*, so as to allow the said standard to turn slightly about *o* as a pivot, for reasons presently to be seen, the head of said screw, bolt, or rivet *o* being countersunk into the cross-bench flush with the top, similar to *e′*, Fig. 5, so that the said cross-bench E may smoothly slide under the sled-body when the runners are bent. The forward ends of the runners are preferably flattened, as at *n*, and are pivotally secured to the connecting-bar G near the ends thereof, either entering the slots *n′*, Fig. 7, in the form of sled shown in Figs. 1 and 8, inclusive, and held therein by means of bolts or rivets *m*, or in the form shown in Figs. 9 to 13, inclusive, being directly bolted or riveted to the under surface of said bar G. A variety of steering devices may be employed for easily bending the runner-frame.

F is the steering-bar, pivoted to turn around the bolt *d* at a point near the forward end of the sled-body. The forward end of the steering-bar F lies within the slot *p*, made in the connecting-bar G in the form of sled shown in Sheet 1 of the drawings, while the rear end is pivotally directed to the seat A, the metal plate H being preferably interposed between.

R is the foot or handle bar, secured to the steering-bar F, preferably at right angles thereto, as shown, in such a manner that when either by the feet or by the hands of the operator the bar R is turned to one side or the other, and with it the steering-bar F, around its pivot *d*, the runners will be deflected lat-

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erally by the bearing of the bar F against the end of the slot *p*, in a manner easily understood by reference to Fig. 3. The rear runner-standard C′, being rigidly secured through the rear cross-bench E′ to the sled body or seat, the lateral deflection of the runner during the steering naturally begins at a point in front of the line *x x*, Fig. 4, and as the runners bend sidewise the forward cross-bench E slides under the seat A, the single rivet *o*, by which each forward standard is secured to the said bench, giving sufficient play to allow the free bending of the runners. When, however, the pressure on the foot or handle bar R is removed, the runners will immediately spring back into their straight normal position, as shown in Fig. 2.

The steering-bar and foot or handle bar R may occupy a horizontal position, as shown in Figs. 1, 2, and 3, or, if desired, may be more or less inclined, as in Fig. 4. When the steering is to be done by the hands alone, and the sled is to be used principally by a coaster who lies flat on the sled-body, the horizontal position of steering-bar is preferable; but when the coaster for the most part sits upright on the seat and applies his feet to the bar R to accomplish the steering, an inclined steering-bar is more desirable, since then the direct pressure to be applied will be nearer in line with the natural position of the leg of the coaster when the latter is in a sitting posture. Either form, however, can be used for both kinds of steering.

The inclined steering-bar may be applied in various ways. As shown in Fig. 4, the steering-bar is pivoted to the sled-seat above the same instead of below, and a wedge-piece I is interposed between the metal plate H and the upper surface of the sled, the steering-bar in this case turning about its pivot on an inclined surface.

The peculiar form of runner herein shown is particularly adapted for carrying out the principle of steering by bending the runners laterally, since from their shape they are exceedingly stiff vertically, but may be readily bent horizontally to accomplish the desired purpose. Moreover, the struck-up metal standards C C′ of the form herein shown are particularly strong and easily made.

As usually constructed, sled-runner standards are made in two separate parts—viz., the upright supporting portion of the standard attached to the runners and a diagonal brace or crow-foot-shaped angle-iron bolted to the sled-body and to the legs of the supporting-standard. In the improved standard herein shown both these parts are combined integrally in one and the same piece, the portion *c′* of the standard taking the place of the separate diagonal brace, and at the same time furnishing the standard with an enlarged top bearing-surface, thus greatly increasing its strength.

The sled may, if desired, be furnished with a spring-supported oscillating seat to ride more easily over rough places by easing the pounding of the sled. The object of the oscillating seat, which is hinged or movably attached near its center to the sled-body, is to allow the seat itself, with the load thereon, to always ride evenly, notwithstanding the unevenness of the track and the consequent jarring of the body of the sled. This oscillating seat may be detachable, as indicated in Fig. 8, wherein the seat A′ is hinged near its center at H′ to the bar L, bolted to the sled-body, and is held in position near its forward end by the spring S, which may either bear directly against the seat A or pass down through a hole in said seat and bear against any suitable projection from the frame. By removing the bolts securing the bar to the sled-body the oscillating seat A′ may be detached and the sled used without it when desired. These improvements may be applied to sleds of any size.

In Figs. 9, 10, and 11 I have shown a modified form of sled built to carry a number of persons. In sleds of a large size I preferably employ a skeleton or frame body supported by the runner-frame and in turn supporting the seat A′. The frame-body in the sled herein shown consists of the side bars N′, bolted to the cross-benches E′ E′, and the cross-bar E^2. The runner-frame in this case consists of the single runners B B and the three standards C C′ C′ on each runner, to the tops of which are bolted the cross-benches E E′ E′, in such a manner that when the runner-frame is bent laterally the foremost cross-bench E slides under the bar E^2, which is bolted to the frame. The runners may, if desired, be bent upward at *a′* to reduce the amount of bearing-surface along the ground. On the skeleton body is supported the seat A′ by means of elastic sleeves K, made, preferably, of rubber and grouped close under its center, as shown, the seat being held in place by bolts *k* passing through the said sleeves, as clearly shown in Figs. 9 and 10. The rubber sleeves are sufficiently soft to enable the seat, as in the former case, to oscillate about an axis near its center, the amount of oscillation being readily regulated by the position of the nuts on the bolts *k*. The form of steering device shown in this sled is one of a great many modifications that might be employed to carry out the same object of laterally bending the runner-frame. The steering-bar F is pivoted near its rear end at *d* to a forwardly-projecting piece A^2, secured to the body of the sled, and at its forward end is pivoted at *d′* to the connecting-bar G. The steering-bar is turned from side to side by means of the foot-bar R, rigidly secured thereto, through which also preferably passes the pivotal bolt *d′*. The forward ends of the runners being bolted or riveted to the ends of the connecting-bar G, by the turning of the foot-bar R on its pivot the runners B will be deflected and the steering thus accomplished.

T is a strengthening stay-bar on each side,

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pivotally secured at its rear end to the cross-bench E, in this case by the single rivet *o*, that holds the forward standard thereto, and at its forward end secured to the under side of the connecting-bar G, preferably by the rivet *t*, which also secures the runner to said bar, as shown in Fig. 12.

The forward cross-bench E, while adapted to slide under the cross-bar E^2, may, if desired, be strapped thereto, so that the two are held in contact by the straps *o' o'*, preferably of metal, screwed or bolted to the cross-bench E, and secured also to the bar O, which bears along the top of the cross-bar E^2. By this means the two are held together against any vertical tendency to part them; but one may move longitudinally in respect to the other.

I claim—

1. A sled having laterally-bending runners, substantially as and for the purposes described.

2. A sled having laterally-bending runners elastic in a horizontal plane, substantially as and for the purposes described.

3. In a sled, the combination, with laterally-bending runners, of standards secured to said runners, cross-benches secured to said standards, and a sled-body secured to the rearmost cross-bench, but free to slide over the forward bench, substantially as described.

4. In a sled, a laterally-bending runner-frame, in combination with a sled-body secured to said runner-frame near the rear of the same, substantially as and for the purposes described.

5. In a sled, a laterally-bending runner-frame, in combination with a sled-body secured to said runner-frame near the rear of the same, and a suitable steering device, whereby the lateral bending of the runner-frame is accomplished either by the hands or feet, substantially as described.

6. In a sled having laterally-bending runners, a steering device consisting of a connecting-bar secured to said runners, in combination with a steering-bar pivoted to the sled-body and connected with the said connecting-bar, and a foot or handle bar secured to the steering-bar, substantially as described.

7. In a sled having laterally-bending runners, a steering device consisting of a connecting-bar secured to said runners, in combination with a steering-bar pivotally secured to the sled-body and to the said connecting-bar, and a foot or handle bar, substantially as described.

8. In a sled, a laterally-bending runner-frame, in combination with a sled-body secured to said frame near the rear end of the same, a connecting-bar G, a steering-bar pivoted to the sled-body and to the connecting-bar, and a foot or handle bar R, secured to the steering-bar, substantially as described.

9. In a sled having laterally-bending runners, a steering device consisting of a connecting-bar, a steering-bar pivoted to the body of the sled and to the connecting-bar, and a foot or handle bar secured to the steering-bar, substantially as described.

10. A sled provided with a detachable oscillating seat pivoted near its center, substantially as described.

11. A sled provided with an oscillating spring-seat supported near its center on elastic sleeves K and held by regulating-bolts *k*, substantially as and for the purposes described.

12. A sled provided with one-piece runners having the bent portion *a'*, substantially as and for the purposes described.

13. In a sled having a laterally-movable cross-bench, the straps O', in combination with the bar O and the said cross-bench, substantially as and for the purposes described.

In witness whereof I have hereunto set my hand.

SAML. L. ALLEN.

Witnesses:

JOHN C. ALLEN, Jr.,

JOHN J. HOFFECKER.