

(No Model.)

2 Sheets—Sheet 1.

W. E. PRINDLE.
SLED PROPELLER.

No. 531,274.

Patented Dec. 18, 1894.

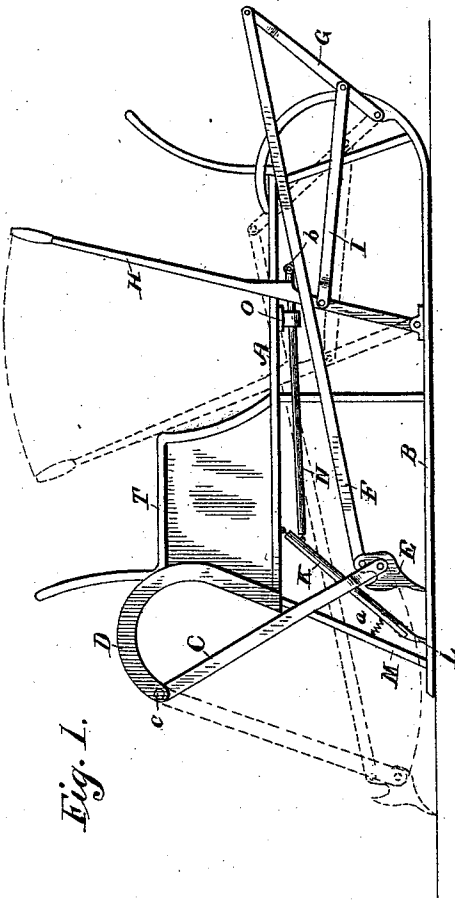


Fig. 1.

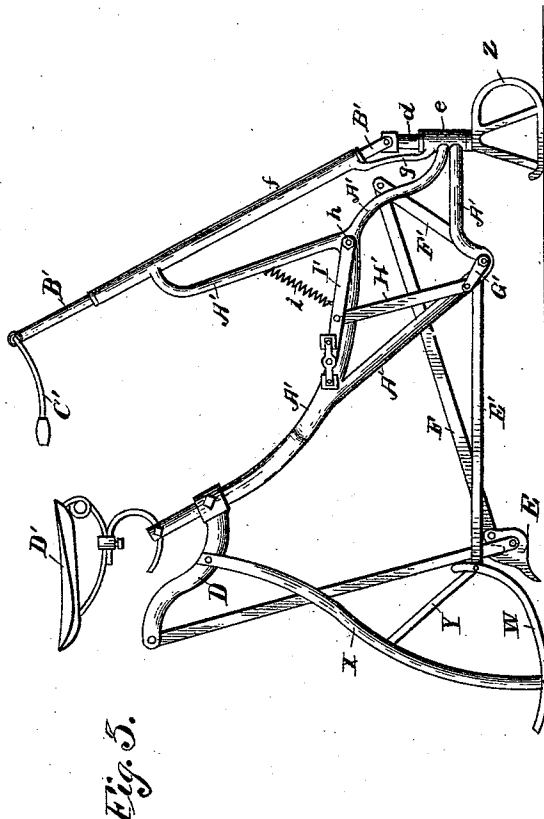


Fig. 5.

WITNESSES.

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INVENTOR.

William E. Prindle.

by John J. Halsted

his Attorneys.

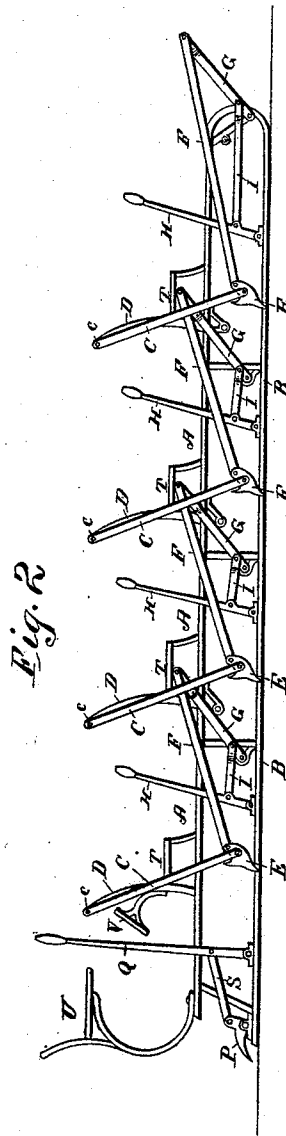
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UNITED STATES PATENT OFFICE.

WILLIAM E. PRINDLE, OF AURORA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
ALFRED H. RAMEY, OF SAME PLACE.

SLED-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 531,274, dated December 18, 1894.

Application filed March 23, 1894. Serial No. 504,845. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. PRINDLE, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful
5 Improvements in Vehicles to be Propelled by the Rider or Riders on Ice or Snow; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to
10 which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

15 The object of my invention is to provide means for propelling sleds, by the use of which a very slight degree of power will give a strong impetus to the sled, and without any tendency to lift the sled by such use, and also
20 to provide means for steering and for "braking" the sled by the agency of the same device that is used for propelling it.

My invention consists generally in a system of levers, to one of which is pivoted a
25 swinging lever spur for biting the snow or ice and propelling the sled, one arm of said spur being connected indirectly to the operating lever, whereby the movement in one direction of the operating lever will cause the
30 spur to bite the snow or ice and propel the sled with a long sweep, while the reverse movement of the operating lever will raise the spur from the ground and return it to its former position.

35 My invention also includes an additional spur serving as a brake, and which is brought into operation in the reverse direction from that of the propelling spur, and only when needed, by giving to the return movement of the operating or propelling lever a longer
40 forward sweep than is required when propelling the sled, and whereby the bringing into use of said additional spur (if situated half way between the runners) or when one
45 of said spurs is on each side of the sled and both are operated, they will act as a brake; or when one only of said spurs is operated, it will serve to guide or steer in the direction on the side of which said spur is located.

50 In the accompanying drawings: Figure 1 is a side elevation of a sled with my invention

applied thereto, only one set of my improved devices being shown, those for the other side it is to be understood being duplicates of those illustrated. Fig. 2 is a similar view of
55 my invention as applied to a long sled to be used by several persons, and showing a multiplication of the propelling devices. Fig. 3 shows my invention as applied to a bicycle sled.

60 Similar letters represent like parts in all the figures.

A is the sled body and B is one of its runners.

C is a swinging bar or arm which is suspended from bracket D at the back part of
65 the sled; and E is a lever spur pivoted between its ends to the lower end of said arm C. The arm of the spur E opposite to that which is adapted to bite the ground is pivotally connected to one end of a long longitudinally movable rod or link F, in such manner that the first part of the forward movement of said link will raise the biting end of the spur E from the ground, and the first part
70 of the backward movement of the rod F will lower the biting end of the spur to the ground. The other end of the link F is pivoted to the upper end of lever G, which is journaled at its lower end to the front portion of the sled or to the inside of the runner. (See Figs. 1
75 and 2.)

H is a hand lever (Figs. 1 and 2), journaled at its lower end to the lower part of the sled or to the inside of the runner, and extending some distance above the sled body A, and said
80 lever is connected to the lever G by a link I.

The above named devices constitute the propelling apparatus of the sled.

K is a lever fulcrumed at its upper end to the sled body A back of the lever H, extending somewhat rearward and provided at its
90 lower end with a fixed spur L. A coil spring a (Fig. 1) connects the lever K with the rear portion M of the sled frame, and serves to hold the spur L up out of contact with the snow or ice when the lever K is not brought
95 into operation.

N is a rod or link supported in a guide yoke O which is secured to the sled body A, one end of said link N being loosely attached or
100 pivoted to the lever K, while said link is provided at or near its forward end and in front

of the lever H with a lateral pin or projection *b*, said pin or projection extending across the line of movement of said lever H.

The operation of the apparatus is as follows: The parts being in their normal positions, as shown in Fig. 1, with the hand lever H almost vertical, when said lever is drawn backward or toward the back of the sled, the beginning of said movement, will through the instrumentality of the link I, lever G, and rod F, cause first the lever spur E to swing down upon the snow or ice-covered ground while the continued backward movement of said lever H, will cause the rod F to push the spur E backward upon the snow or ice with a long sweep of the arm C in the arc of a circle, this arm being the radius of the same, with its pivotal suspended point *c* as its center. This long sweep of the spur E, which can be given in a moment by the above system of links and levers, and by only a comparatively short movement of the hand lever H, will give a decided impetus to the sled and impel it forward a considerable distance, and by only one stroke. On the return or forward movement of the hand lever H, the spur E will first be swung up away from the ground, and on the continuation of said movement the parts will be returned to their original positions.

If it be desired to steer or brake the sled, a still further forward movement of the lever H will cause it to strike against the pin or projection *b* of the rod N and to force it forward so as to draw down the spur L upon the ground. If the lever H on the right side of the sled be so operated, the corresponding spur L will be brought into play, and the sled will be guided to the right, and if the spur L on the left of the sled be brought into play by its lever H, the sled will be guided to the left. If, however, both spurs are drawn down against the ground, the sled will be "braked," which will also be the case if there be only one spur L, and at a point half way between the runners. On the return movement of the lever or levers H, the spring or springs *a* will draw up the spur or spurs L away from contact with the ground.

In the modification shown in Fig. 2, a different steering and brake mechanism is used from that shown in Fig. 1, viz: Pivoted to each runner B near its rear end is a lever spur P, and in front of said lever spur and also pivoted to the runner, is a hand lever Q, similar to the levers H; said lever Q and one arm of the lever spur P being loosely connected by a link S. This mechanism is entirely independent of the propelling mechanism, and is adapted to be operated by a person sitting back of said lever Q, the operation of the parts just above described being as follows: When the lever Q on one side of the sled is drawn back, the point of the spur P will be brought into contact with the snow or ice-covered ground and the sled will be guided in the direction of the side on which said spur is located, and when both levers Q

are drawn back, both of said spurs P will be forced against the ground, and the sled will be braked. When the handle Q is pushed forward, its corresponding spur P will be raised away from the ground.

In Figs. 1 and 2 I have shown raised seats T for the riders on the sled, and in Fig. 2 with the hanging arm C suspended from the backs of said seats. In Fig. 2 also I have shown the seat U for the steerer and brakeman raised much higher than the other seats, in order that he may be able to look over the heads of the other riders, and have provided a foot rest V for him which is connected to the back of the seat in front of said seat U. As the seat U is raised so much above the others, it is necessary that the lever Q should be much longer than the levers H, as shown.

In Fig. 3 I have shown my invention as applied to a sled of the form of a bicycle. In this construction, instead of having long parallel runners, as shown in the preceding figures, the sled is supported preferably on three runners, two in the rear and one in front; or, when adapted for racing, on two small runners arranged in line like the two wheels of a bicycle. The rear runner (or runners) W is fixed and rigidly supported by the upright braces X and Y, and the front runner Z is provided with an upwardly extending journal rod *d*, which passes through a fixed sleeve *e* on the front of the supporting frame A', and which is adapted to be turned in said sleeve to steer the sled. Forming also a part of the frame A' is a long sleeve *f* extending above the sleeve *e* and connected therewith by a brace *g*. The upper part of the journal rod *d* is jointed to the steering rod B which passes through the sleeve *f* and which is also provided with the steering handle C'. The seat D' is supported on the rear portion of the frame A' and back of the handle C.

The above described parts are like and correspond to similar parts of a bicycle.

E' is a longitudinal brace which connects the rear runner W with the lower portion of the frame A'.

Instead of the simple lever G, as shown in Figs. 1 and 2, I use a bell-crank lever F', G' pivoted to the lower part of the frame A', the long upper arm F' of said lever being pivoted to the rod F, and the shorter arm G' to a link H', which is also pivoted to a treadle lever I'. Said treadle lever is pivotally suspended upon the frame A' at *h*, and a coil spring *i* connects the treadle I' with that part of the frame A' above said treadle, and serves to keep the same raised when not depressed by the rider's foot or otherwise. The pressure on the treadle I', will, through the intervention of the link H', depress the arm G' of the bell-crank lever, and cause the arm F' of said lever and the rod F to move rearward, when the same turning and sweeping action of the spur E will take place as was related in connection with the other figures. When pressure upon the pedal I' is

removed, the spring *i* will draw the link H', spur E and intermediate parts back to their former positions, with the spur E raised up away from the ground.

5 What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a sled or other vehicle for riding over the snow and ice, a swinging arm suspended from the sled or vehicle, the spur pivoted between its ends to said arm, the operating lever pivoted in front of said arm, and one arm of said spur being connected indirectly with the operating lever, all substantially as and for the purposes set forth.

15 2. In combination with a sled or other vehicle for riding over the snow and ice, a swinging arm suspended from the sled or vehicle, the spur pivoted between its ends to said arm, the operating lever pivoted in front of said arm, a lever pivoted in front of the operating lever, a link connecting said two levers, and another link connecting the lever in front of the operating lever with one arm of the spur, all combined and adapted to operate as set forth.

25 3. In combination with a sled or other ve-

hicle for riding over the snow and ice, a swinging arm suspended from the sled or vehicle, the spur E pivoted between its ends to said arm, and a longitudinally movable rod connected with one arm of the spur, said arm being adapted to raise the biting end of the spur on the first part of its forward movement, and to lower said end of the spur to the ground on the first part of the backward movement of said rod, all as and for the purposes set forth.

4. In combination with the lever for operating the propelling devices of the sled or other vehicle, the rod N, loosely suspended from the sled body, and provided with a pin or projection extending over the line of return movement of the propelling lever and adapted to engage with said lever, the swinging lever K having a spur on its lower end, and connected with the rod N, and means for holding up said lever and spur out of contact with the snow or ice, except when said lever is operated, all as set forth.

WILLIAM E. PRINDLE.

Witnesses:

ALICE M. CALLAN,
CLARA LUCK.