

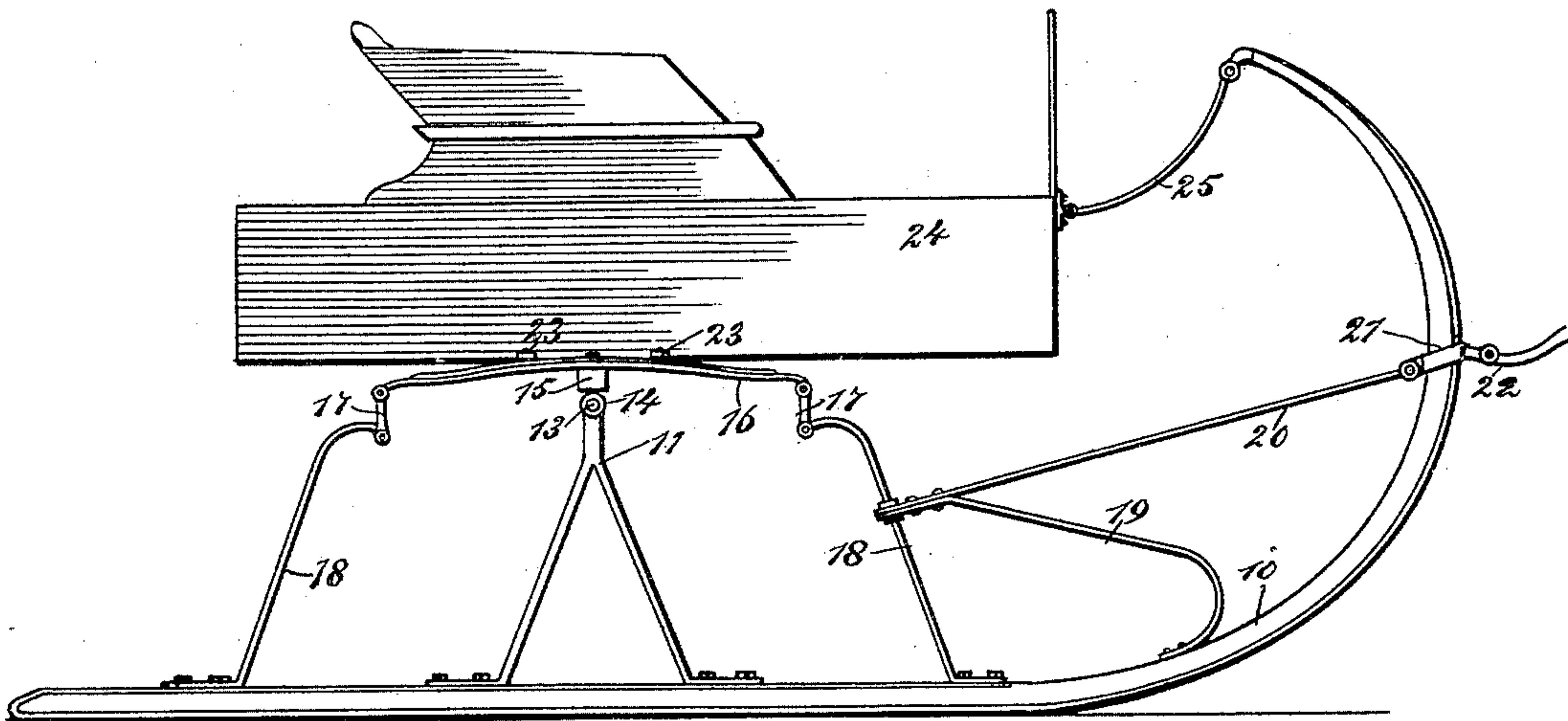
(No Model.)

O. A. NORMANN.  
SLEIGH.

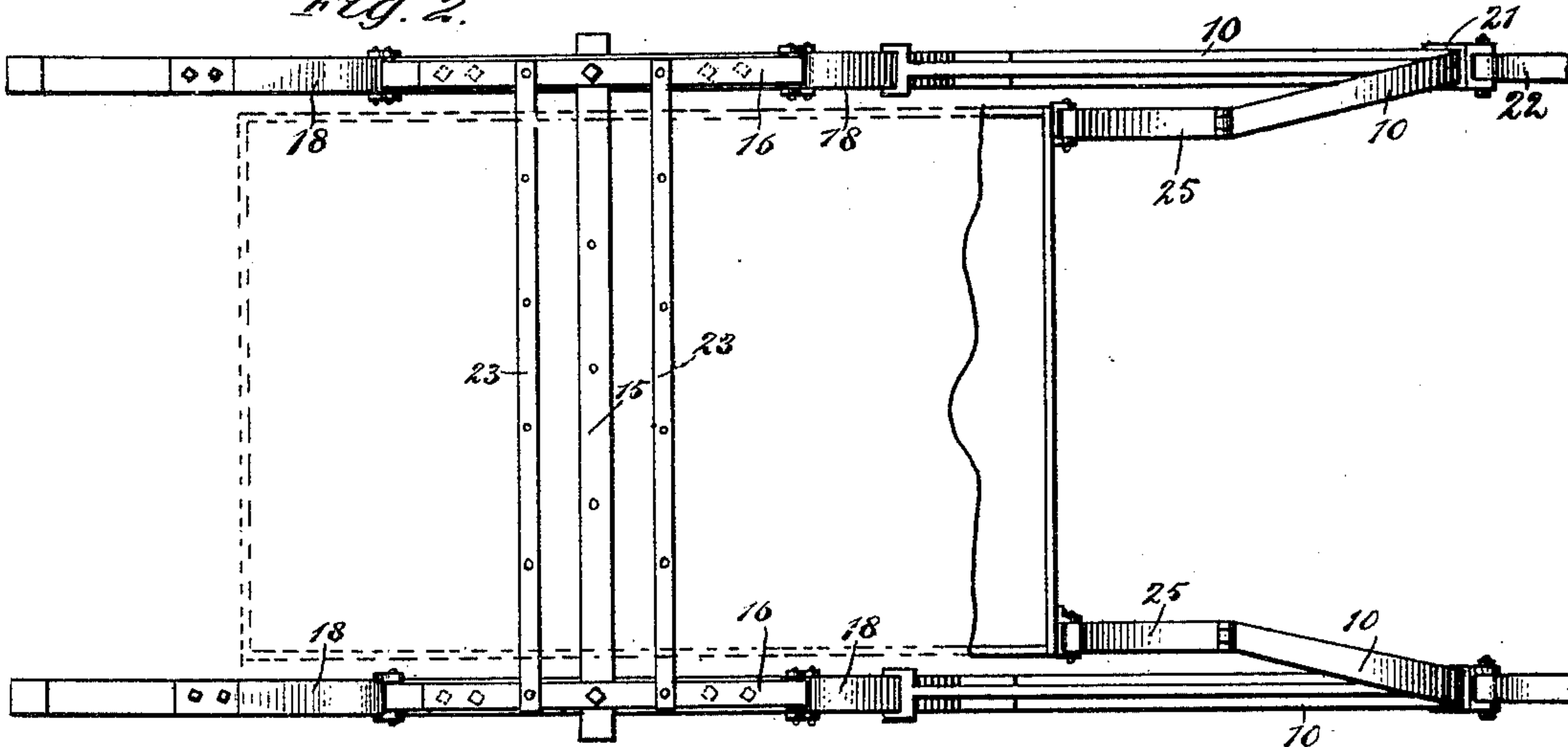
No. 467,826.

Patented Jan. 26, 1892.

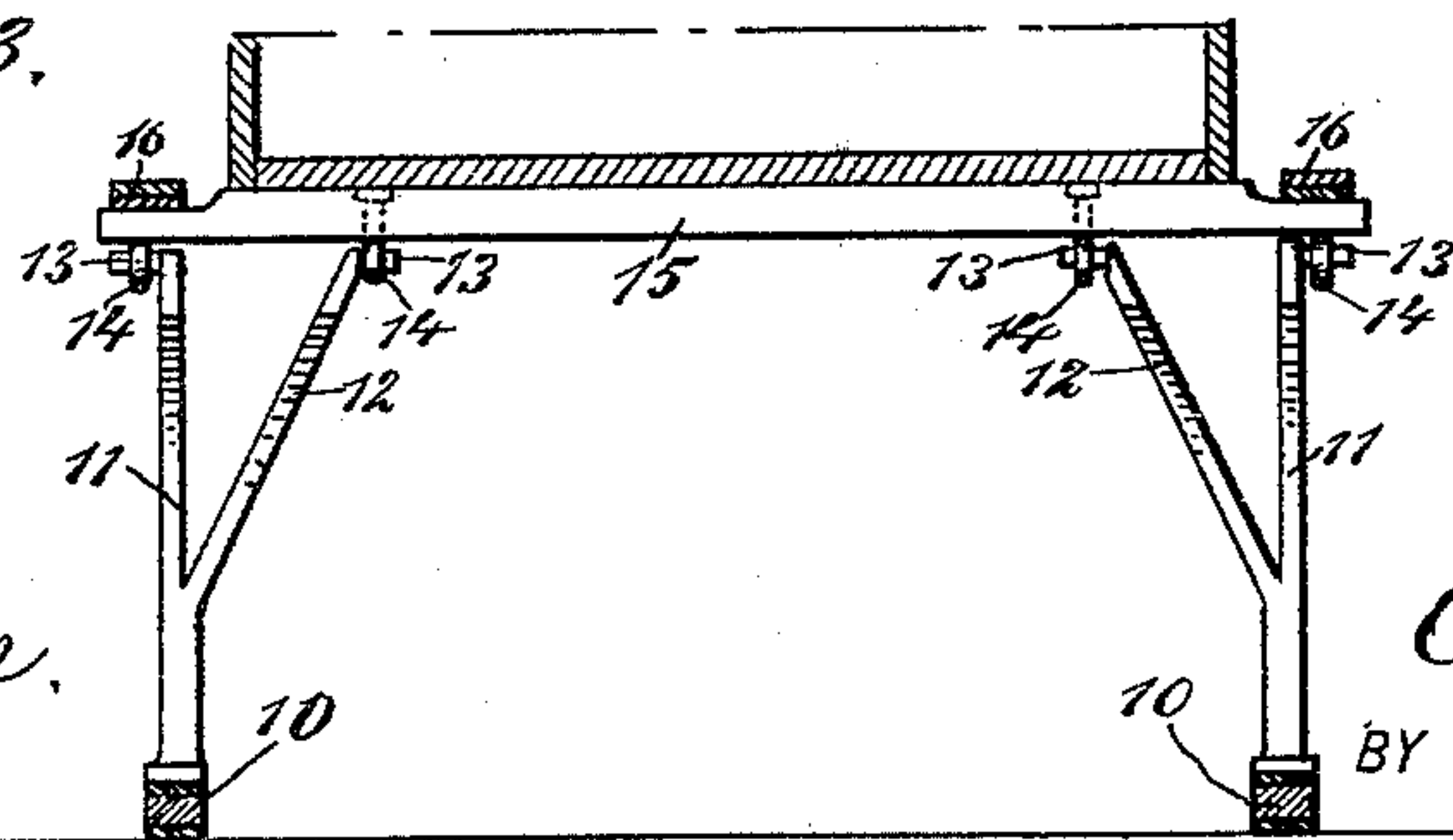
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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INVENTOR:

*O. A. Normann*  
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# UNITED STATES PATENT OFFICE.

OLAUS A. NORMANN, OF ST. OLOFF, MINNESOTA.

## SLEIGH.

SPECIFICATION forming part of Letters Patent No. 467,826, dated January 26, 1892.

Application filed April 24, 1891. Serial No. 390,290. (No model.)

*To all whom it may concern:*

Be it known that I, OLAUS A. NORMANN, of St. Oloff, in the county of Otter Tail and State of Minnesota, have invented a new and Improved Sleigh, of which the following is a full, clear, and exact description.

My invention relates to improvements in sleighs; and the object of my invention is to produce a sleigh of simple construction which may be cheaply built, which will not easily capsize, which will conform to the inequalities of the road and will not jump, and which is so flexible that it will ride very easily.

To this end my invention consists of a sleigh constructed substantially as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a sleigh embodying my invention. Fig. 2 is a broken plan view of the same, and Fig. 3 is a broken vertical cross-section.

The runners 10 are of the usual construction, except that they are provided with a metallic facing on the upper side to increase their strength, and secured centrally to each runner is a trussed knee 11, each knee having on its inner side a brace 12, which extends diagonally upward, and the upper ends of the knees and braces terminate in laterally-extending lugs 13, the lugs on the braces and trusses being arranged so as to point in opposite directions. These lugs 13 enter eye-bolts 14 on the under side of the bolster 15, which bolster extends transversely beneath the sleigh-body and has centrally upon each end a spring 16, the springs being preferably two-leaved springs, and it will be seen that they will extend above and parallel with the runners.

The springs 16 are provided at the ends with depending links 17, to which they are pivoted, and the lower ends of the links are pivoted to the upper curved ends of rods 18, which rods are firmly secured at their lower ends to the sleigh-runners 10. The forward rods 18 are also connected with braces 19 and 20, which are attached to the rods near the center, the braces 19 extending forward and being curved downward, so as to connect with

the sleigh-runner near the bottom of the latter, and the braces 20 extend forward and upward, and are secured to the front portion of the runners by clips 21, which clips also support thill-couplings 22. The springs 16 are connected together by parallel cross-bars 23, which are arranged on each side of the bolster 15, and the sleigh-box 24 is firmly secured to the bolster and to the cross-bars.

I have shown a square box for the sleigh, somewhat like a buggy-box; but it is obvious that any form of box may be used. The box 24 is connected at its forward corners with the upper ends of the runners 10 by flat curved springs 25, which are hinged to the runners and to the sleigh-box, and it will be observed that by means of this connection the front portion of the sleigh-runners will be capable of a vertical movement and will be held from moving laterally.

From the foregoing description it will be seen that when the sleigh meets with any obstruction or inequalities in the road the box 24, by means of its hinged connection with the running-gear, will remain in a level position, so that the riders will not be jolted, while the runners will oscillate and pass easily over the obstruction. It will also be seen that the runners are to a certain extent independent of each other and that if one runner meets with an obstruction, while the other does not, the flexible connections between the runners and between the runners and the body-box will cause the sleigh to pass over the obstruction without jumping, and it will be seen from the foregoing description that the sleigh constructed as described is extremely simple and cheap, as well as durable and of easy draft.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a sleigh, the combination, with the runners and knees secured thereto, of a body pivotally supported on the knees, springs connected to the body, one at each side thereof, and link connections between the springs and the runners, substantially as described.

2. In a sleigh, the combination, with the runners and knees secured thereto, of a body pivotally supported on the knees, springs connected to the body, one at each side thereof,



rods secured to the runners, and links pivoted to the said rods and to the ends of the springs, substantially as described.

3. In a sleigh, the combination, with the  
5 runners provided with knees, of a body pivotally supported on the knees, springs connected to the body, one at each side thereof, rods secured to the runners, links pivoted to the rods and springs, and springs connecting  
10 the upper ends of the runners with the forward part of the body, substantially as herein shown and described.

4. In a sleigh, the combination, with the runners and knees secured to the runners and  
15 provided with diagonal braces, said knees and braces having laterally-extending lugs, of a body provided on its under side with a bolster having eyes to receive the said lugs, springs secured to the bolster, cross-bars con-

necting the springs and secured to the body, 20 rods secured to the runners, and links pivoted to the rods and springs, substantially as described.

5. In a sleigh, the combination, with the runners and knees secured thereto, of a body 25 provided on its under side with a bolster, to which the knees are pivoted, springs secured to the ends of the bolster, cross-bars connecting the springs and secured to the body, rods secured to the runners, links pivoted to the 30 rods and springs, and springs hinged to the upper ends of the runners and to the forward part of the body, substantially as herein shown and described.

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Witnesses:

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