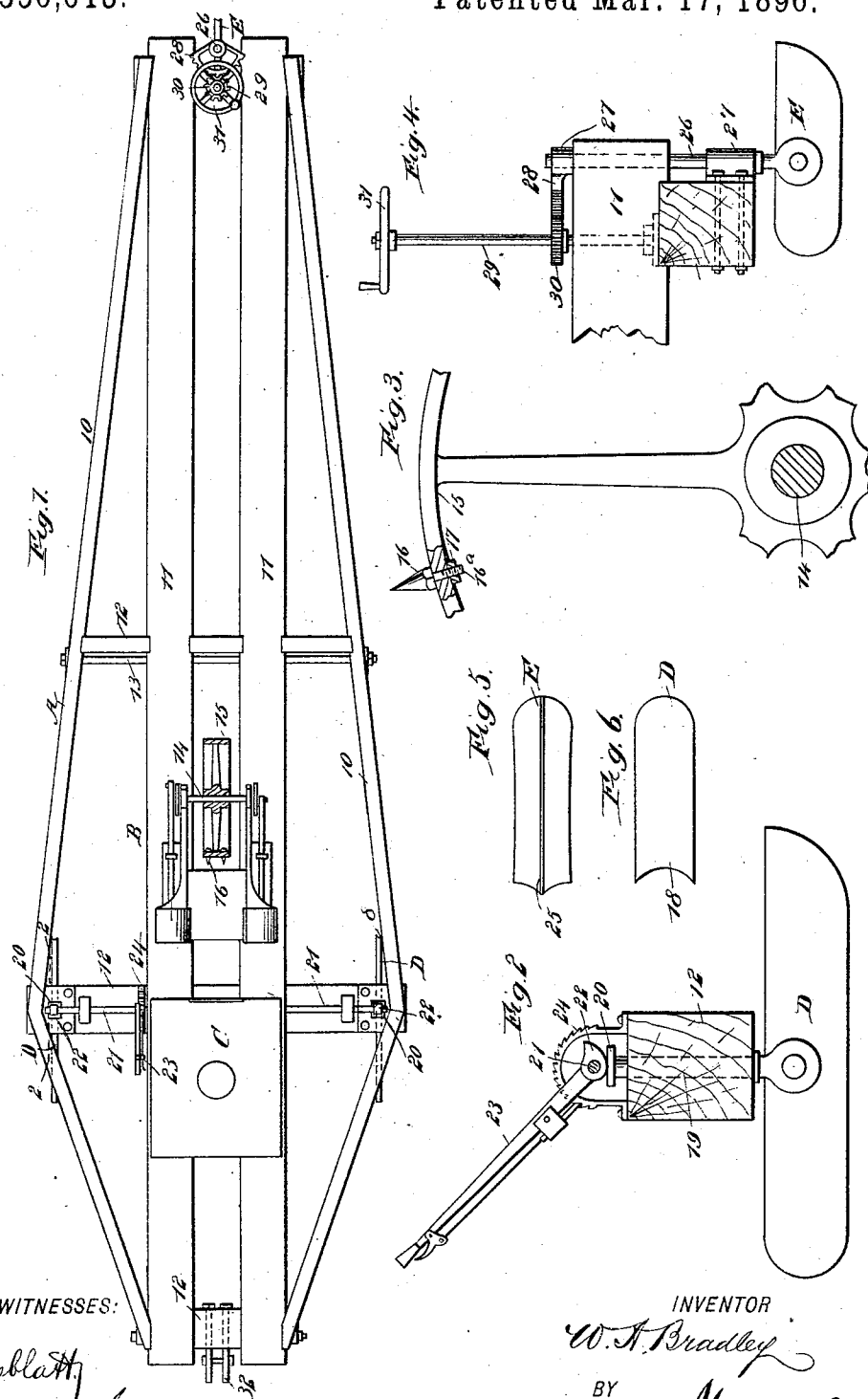


(No Model.)

W. A. BRADLEY.
SLED PROPELLER.

No. 556,613.

Patented Mar. 17, 1896.



WITNESSES:

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WILLIS A. BRADLEY, OF GEM, IDAHO.

SLED-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 556,613, dated March 17, 1896.

Application filed April 29, 1895. Serial No. 547,948. (No model.)

To all whom it may concern:

Be it known that I, WILLIS A. BRADLEY, of Gem, in the county of Shoshone and State of Idaho, have invented a new and Improved Ice-Boat, of which the following is a full, clear, and exact description.

My invention relates to an ice-boat adapted to be driven and controlled by steam, and to act in the capacity of an engine of a train if desired, providing a means for traveling on rivers or other bodies of water when frozen over and water navigation is closed.

A further object of this invention is to provide a steam-propelled ice-boat which will be exceedingly simple, durable, and economic in its construction.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a plan view of the ice-boat, the flooring having been removed. Fig. 2 is a section taken transversely through one of the beams, substantially on the line 2 2 of Fig. 1, illustrating one of the side runners and means for raising and lowering the bolt. Fig. 3 is a side elevation of a portion of the driving-wheel, illustrating the character of the teeth employed and the manner of securing them. Fig. 4 is a section through a cross-beam at the front of the machine, illustrating the steering-runner and the manner of operating the same. Fig. 5 is a bottom plan view of the steering-runner, and Fig. 6 is a similar view of a side runner.

In carrying out the invention the body A of the boat may be given any desired shape. Usually, however, it is made to taper from a point between the center and back in direction of the front and the rear, the front and rear being therefore the narrowest parts of the structure. The framing of the body consists of side beams 10, intermediate longitudinal beams 11, cross-beams 12 and tie-rods 13, although the frame may be otherwise constructed, if desired. This frame is usually

floored over, the flooring, however, having been omitted in the drawings, and it is provided with a cabin adapted to contain the engine B, the boiler C, and passengers, if such are to be accommodated, and at the front of this body a pilot-house is to be erected in which the steering-gear is placed.

The engine B is of any approved type, and the driving-shaft 14 operated thereby has mounted thereon the driving-wheel 15 of the body, the said wheel being adapted to engage directly with the ice. This wheel is of predetermined diameter, and in its periphery series of spikes 16 are located, being usually placed in transverse rows. These spikes, as shown in Fig. 3, are pointed, and each is provided with a shank 16^a, which extends through the periphery of the wheel, and each shank is provided with a nut 17 to hold the spikes in place.

The ice-boat body is supported by three runners, two side runners D and a steering-runner E. The side runners are placed at each side of the widest portion of the frame, and their forward ends are upturned and provided preferably with a longitudinal groove 18, as shown in Fig. 6. Each of these runners is attached at or near its center to a vertical shaft 19, and these shafts are carried upward through suitable openings in the longest cross-beam 12, as shown in Figs. 1 and 2, terminating at the upper end in a head 20. A transverse shaft 21 is journaled upon the aforesaid beam 12, and at each end of this shaft a cam 22 is secured, adapted for engagement with the heads 20 of the runner-shafts 19. The shaft 21 is rocked by means of a lever 23, operated by hand, and provided with a thumb-latch for engagement with a rack 24.

The steering-runner E is usually provided with a longitudinal rib 25 at its front end and extending along its bottom, the front end being rounded off or tapering, as shown in Fig. 5. A shaft 26 is secured to the central portion of the steering-runner, it being placed at the front central portion of the frame and journaled in suitable bearings 27. A toothed segment 28 is secured to the upper end of the steering-shaft, and this segment is operated by means of a hand-shaft 29, provided with

a gear 30, the latter meshing with the segment, the shaft being turned by a hand-wheel 31 or its equivalent.

When starting the ice-boat, the spikes of the drive-wheel 15 are made to cut as deep as possible, so as to obtain purchase, and this is accomplished by rotating the shaft 21 in a direction to permit the frame to drop downward on the side-runner shafts 19, as shown in Fig. 2; but after the boat has attained sufficient headway the said adjusting-shaft 21 is rotated to force the cams 22 downward on the side-runner shafts 19, thereby raising the frame and causing the spikes in the drive-wheel to just contact with the ice. This slight contact is all that is necessary at this time and admits of the boat attaining a high rate of speed. At the end of the boat-frame a coupling 32 is located, in order that other boats may be attached to that shown, which is the driver.

It will be understood that all levers or other appliances employed for controlling the boat are preferably led to the pilot-house.

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

1. An ice-boat, comprising a frame, a runner at each side of the frame, said runners being independently mounted and movable bodily toward and from the frame, means for adjusting the runners, a steering-runner at one end of the frame, means for operating the same, a motor, and a spiked drive-wheel operated by said motor, substantially as described.

2. In an ice-boat, the combination with a frame, and a spiked propelling-wheel mounted therein, of a runner on each side of the frame, said runners being independently mounted and movable bodily toward and from

the frame, and means for adjusting the said runners, substantially as described.

3. In an ice-boat, the combination with a frame, and a spiked wheel mounted therein, of a runner at each side of the frame, a vertical shaft secured to each runner and projecting through an opening in the frame, a transverse shaft provided with cams engaging the said shafts, and means for operating the cams, substantially as described.

4. In an ice-boat, a frame, a motor, a spiked wheel driven by the said motor and adapted for engagement with the ice, and a steering apparatus substantially as described, of supporting-runners located at the sides of the frame, provided with shafts extending loosely upward through the frame, an adjusting-shaft journaled on the frame, a lever whereby the adjusting-shaft is rotated, and cams carried by the adjusting-shaft and having bearing on the runner-shafts, as and for the purpose specified.

5. In an ice-boat, the combination, of a frame, side runners upon which the frame is vertically adjustable, said runners being independently mounted, means for adjusting the frame substantially as described, a motor, a spiked driving-wheel driven by the motor and adapted for engagement with the ice, a steering-runner located at the front of the frame, a shaft extending upward through the said frame from the said steering-runner, a toothed segment attached to the upper end of the shaft, a hand-shaft, and a gear carried by the said shaft and engaging with the teeth in the said segment, as and for the purpose specified.

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Witnesses:

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