No. 606,905. Patented July 5, 1898.

L. WEBER.

COMBINED SLEIGH AND BOAT.

(Application filed Oct. 14, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

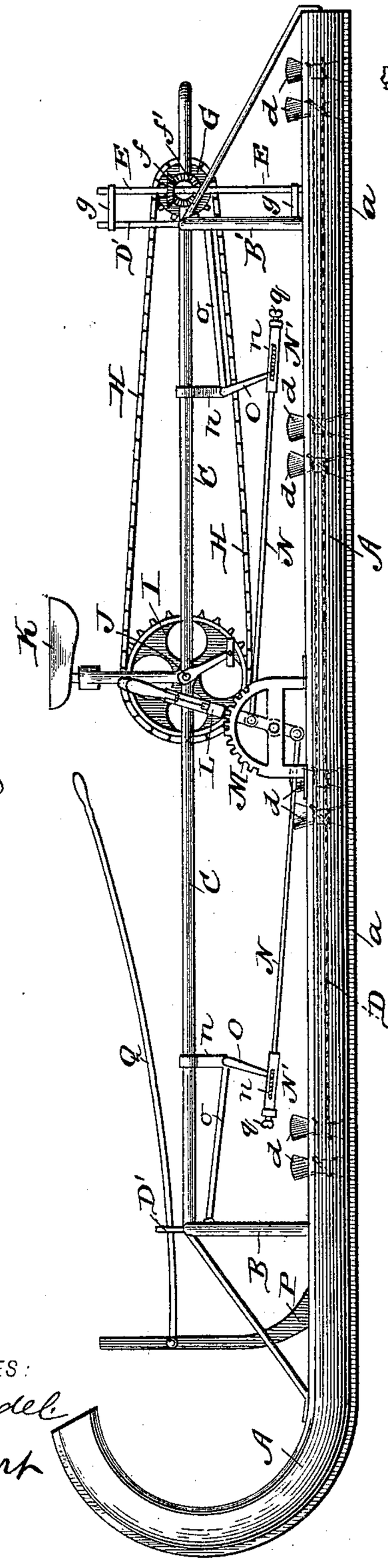


Fig. 4.

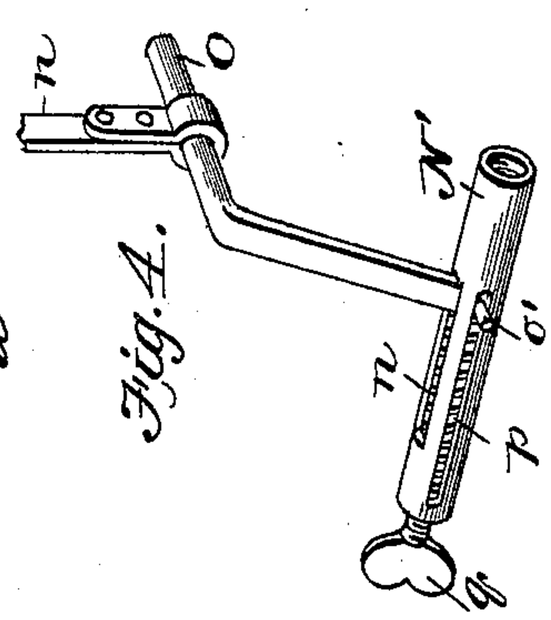


Fig. 2.

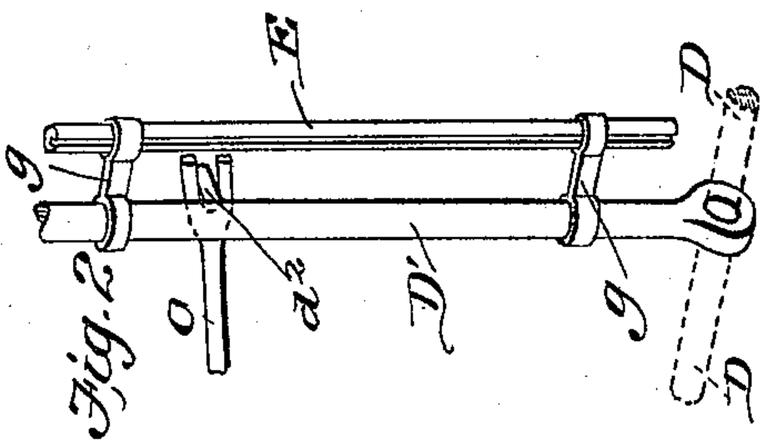
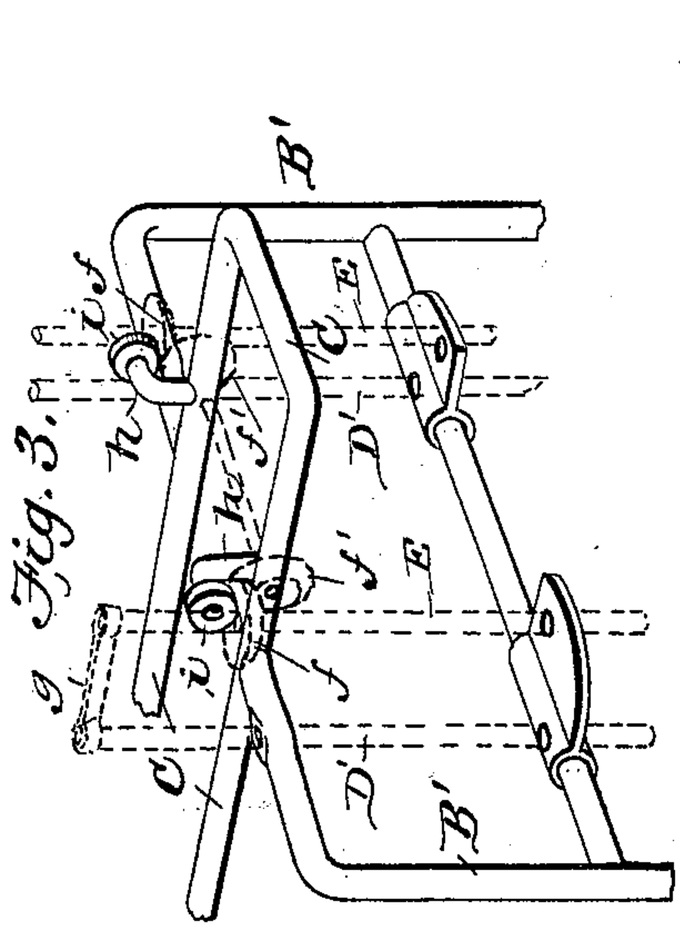


Fig. 3.



WITNESSES:

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Arnold Hart

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Leonard Weber.

BY Munn & Co.

ATTORNEYS.

No. 606,905. Patented July 5, 1898.

L. WEBER.

COMBINED SLEIGH AND BOAT.

(Application filed Oct. 14, 1897.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5

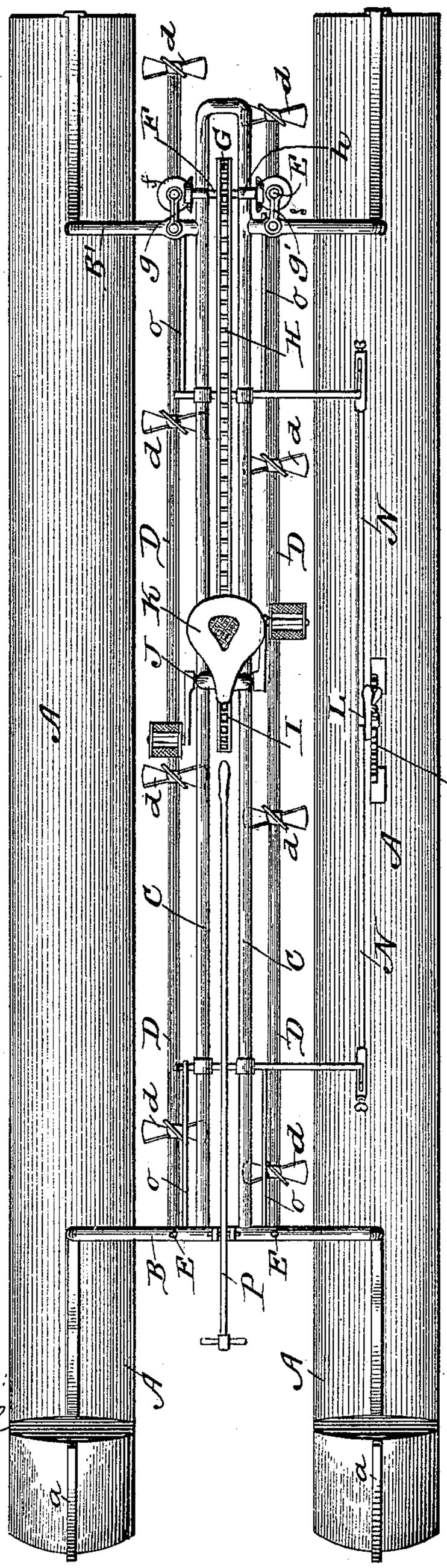


Fig. 8.

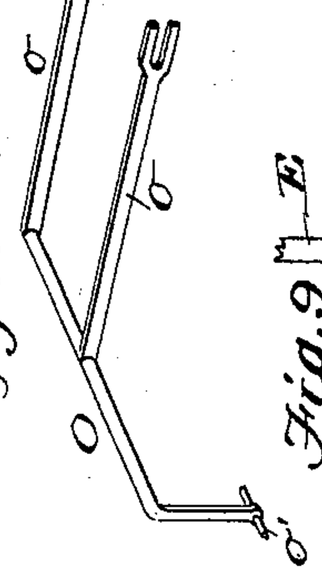


Fig. 9

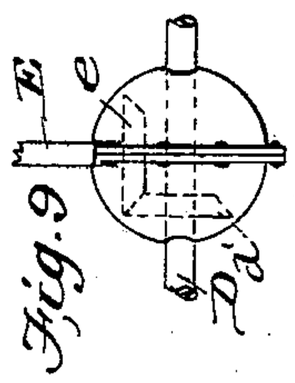


Fig. 7.

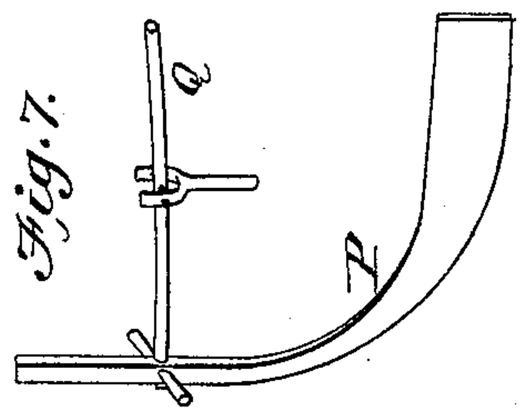
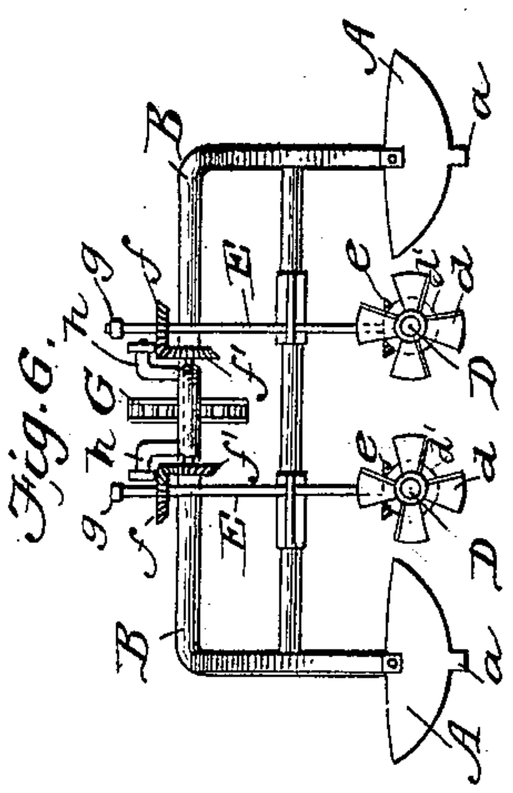


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEONARD WEBER, OF ROSLYN, WASHINGTON.

COMBINED SLEIGH AND BOAT.

SPECIFICATION forming part of Letters Patent No. 606,905, dated July 5, 1898.

Application filed October 14, 1897. Serial No. 655,236. (No model.)

To all whom it may concern:

Be it known that I, LEONARD WEBER, of Roslyn, in the county of Kittitas and State of Washington, have invented a new and Improved Combined Sleigh and Boat, of which the following is a specification.

My invention is a combined sled or sleigh and boat provided with means adapted for propelling it on either land or water. The runners of the sled or sleigh serve also as floats or boats in the water, and the propeller proper is adapted to work on or in snow and also in the water. I describe and illustrate a foot-crank and connected mechanism, whereby foot-power may be applied by the person or persons carried on the sleigh or boat for driving the propellers proper; but any suitable motive power may be used for the same purpose.

In the accompanying drawings, two sheets, Figure 1 is a side view of my invention. Figs. 2, 3, and 4 are perspective detail views hereinafter referred to. Fig. 5, Sheet 2, is a plan view of the invention. Fig. 6 is a rear end view of the same. Figs. 7 and 8 are perspective views hereinafter referred to.

The body of my improved sleigh and boat is composed of two long parallel runners and boats A, whose front ends are curved upward like a toboggan. These are made of wood alone or wood and sheet metal or aluminium or any other suitably strong and light material. The bottoms of the runners A are approximately semicircular in cross-section, while the top portions are flat or nearly so. They are provided with a steel keel *a*, that serves as such in the water and as a shoe or skate on snow or ice.

To adapt the runners A to support a man of average weight in the water, they should be ten or twelve feet long, as many inches wide, and four inches deep. The space between them will vary. The runners are rigidly connected by vertical skeleton iron frames B′ B′, arranged near the front and rear ends, respectively. These brace or bridge frames are made of iron tubes connected by suitable joints. They are connected and braced longitudinally by tubes C, arranged parallel to the runners and over the space that intervenes them. (See Fig. 5.) In the said space are arranged, parallel to the runners A, two shafts D, Figs. 5 and 6, having a series of propeller-blades *d* keyed thereon. Rotation is imparted directly to these shafts D by means of vertical shafts E, Figs. 2 and 6, having on their lower ends bevel-gears *e*, that mesh with similar gears *d′* on the propeller-shafts D. The shafts E derive motion, through bevel-gearing *f* and *f′*, from a horizontal shaft F, Figs. 1 and 5, carrying a sprocket-wheel G, from which an endless chain belt H runs to a larger sprocket-wheel I. The latter is arranged at or near the center of the sleigh, and its axle J is journaled in the brace-tubes C. Directly over the larger sprocket-wheel I is located and supported the operator's seat K, so that he may conveniently propel the sleigh and boat by pedaling, as will be readily understood.

The horizontal propeller-shafts D are journaled in the lower ends of vertically-slidable tubes or rods D′, Figs. 1 and 2, that are held in bearings in the rigid bridge-frames B and B′, and the vertical driving-shafts E, carrying the gears *e f*, are rigidly connected with such slidable tubes D′ by means of clips *g*. The said shafts E have a lengthwise groove, and the upper bevel-gears *f* have a tongue or key that runs in such groove. Thus if the tubes or rods D′ be raised vertically the vertical shafts E and propeller-shafts D will be similarly raised. The upper gears *f* must, however, slide down on the shafts E when the latter are raised, in order to keep in mesh with the gears *f′* of horizontal sprocket-shaft F. Since gravity alone may not suffice to effect this, I provide mechanical means—to wit, the short angular or curved arms *h*, Fig. 3, that project from the rear bridge-frame B′ and extend over the gears *f* and carry at their free ends small antifriction-rollers *i*, which bear and run on the gears *f*, as shown. The operation is obvious.

The means I employ for raising and lowering the propeller-shafts D and connected tubes D′ and shafts E, as above described, are the following: A hand-lever L, Figs. 1 and 5, is pivoted to a segmental rack M and arranged in a vertical plane on one of the runners or floats A adjacent to the operator's seat K. Said lever is provided with a spring-pawl that locks with the rack M. To this lever L, on opposite sides of its fulcrum, are pivoted two connecting-rods N, that extend frontward and rearward and serve to rock crank-shafts O, which are supported horizontally by hangers *n* from the longitudinal braces C. These rock-

shafts O have rigid arms *o*, Figs. 1, 2, and 8, whose free ends are forked to adapt them to loosely engage pins d^2, projecting laterally from the vertical slidable tubes D′. It will now be apparent that by adjusting the hand-lever L forward or back the rock-shafts O will be rocked correspondingly, and the tubes D′ thereby lowered or raised correspondingly, together with propellers *d* and the shafts D. Thus the propellers proper, *d*, may be adjusted vertically, as required to put them into or out of action either in the water or on ice.

To provide for an elastic connection between the rods N and the crank-arms of the rock-shafts O, the said rods N are provided with tubular end sections N′, Figs. 1 and 4, which are slotted lengthwise, as shown. Cross-pins *o′* pass through the horizontal slots in section N′ and also through the crank-arms of rock-shafts O, which arms work in the vertical or upper slots of the sections. By this means the rods N and rock-shafts O are connected. Spiral springs *p* are arranged in the tubular sections N′, and their tension is adjusted by set-screws *q*, which work in the ends of such sections. The springs *p* take up the shock and bouncing of the sleigh and boat incident to contact of the propeller-blades *d* with some fixed object—as a stone, rock, or log—lying below the surface of the snow or water.

For steering the craft I provide a rudder P, Figs. 1, 5, and 7, which is a long curved blade. The same is attached to a hand-lever Q, that is fulcrumed in a forked pivot set in the front bridge-frame B. The operation of this rudder in the water or in soft snow is obvious. On ice or very hard snow the rudder is pressed down till the front end of the runners is raised clear from the same, and then by turning the lever Q to right or left the sleigh will be caused to go to the left or right correspondingly. A clamp or other suitable device may be employed to provide for adjustment of the lever up or down on the shank of the rudder.

The wings or propellers proper, *d*, of the respective shafts D alternate in position, as shown in Fig. 5. The outer edges of the wings *d* are made sharp to adapt them to cut into ice or snow-crust, and such edges being inclined or diagonal to the axis of the sleigh it is apparent that they will cause propulsion by taking into the glassy surface.

I propose to employ roller-bearings for the rotatable shafts.

What I claim is—

1. The combination, with the parallel runners and floats, of a rotary propeller-shaft arranged between them, means for adjusting the shaft bodily vertically, propellers attached to said shaft and composed of radial spiral blades, a laterally-movable guiding device which is pivoted between the runners and made adjustable vertically, so that its lower edge may work in the same plane as the propeller-blades, as shown and described.

2. The combination, with the parallel runners and floats, of the guiding-rudder arranged at the front between said runners, and a lever connected with and supporting the rudder and pivoted on a fixed fulcrum, and extending back toward the operator's seat, as shown and described, whereby shifting the lever shifts the rudder bodily as specified.

3. The combination, with the parallel floats or hulls, and propeller-shafts D, of the vertically-slidable rods D′, in which said shafts are hung, rock-shafts O, arms *o* connecting the latter with said rods, the hand-lever L, and connecting-rods extending from it to the rock-shaft, as shown and described.

4. The combination, with the two parallel floats, of a propeller-shaft arranged in the free space between them, and carrying a series of propellers properly arranged at different points in its length, vertically-slidable rods, or hangers, attached to the end portions of said shaft, levers and rods for adjusting the hangers vertically, and means arranged intermediately for connecting the rods, substantially as shown and described.

5. The combination with the floats and propeller-shafts, vertically-slidable carriers or supports for the latter, rock-shafts connected with such carriers, and lever and rods for actuating the rock-shaft to adjust the propeller-shafts higher or lower, substantially as shown and described.

6. The combination, with the runners or floats, and shafts carrying propellers, of vertically-adjustable carriers for said shafts, rock-shafts having arms for raising and lowering said carriers, a lever and rod connecting the same with the crank-arm of the rock-shaft, and an elastic connection between the rod and said crank-arm, as shown and described.

7. The combination, with the parallel runners or floats, and a propeller-shaft arranged between them, of vertically-slidable tubes or rods, supporting said shaft, rock-shafts having arms that are loosely connected with said rods, a lever and connecting-rods which are provided with slotted sections wherein the crank-arms of the rock-shafts are adapted to slide, and springs pressing on said arms, as shown and described for the purpose specified.

8. The combination, with runners or floats, and a propeller-shaft, of a vertically-slidable shaft, having a groove as specified, gears connecting such shafts, a driving-shaft and gears, one of which slides on the grooved shaft but is keyed so as to rotate therewith, and a fixed arm carrying a roller that runs on such slidable gear, as shown and described, for the purpose specified.

LEONARD WEBER.

Witnesses:
GEO. KOPPEN,
EDWARD BIRN.