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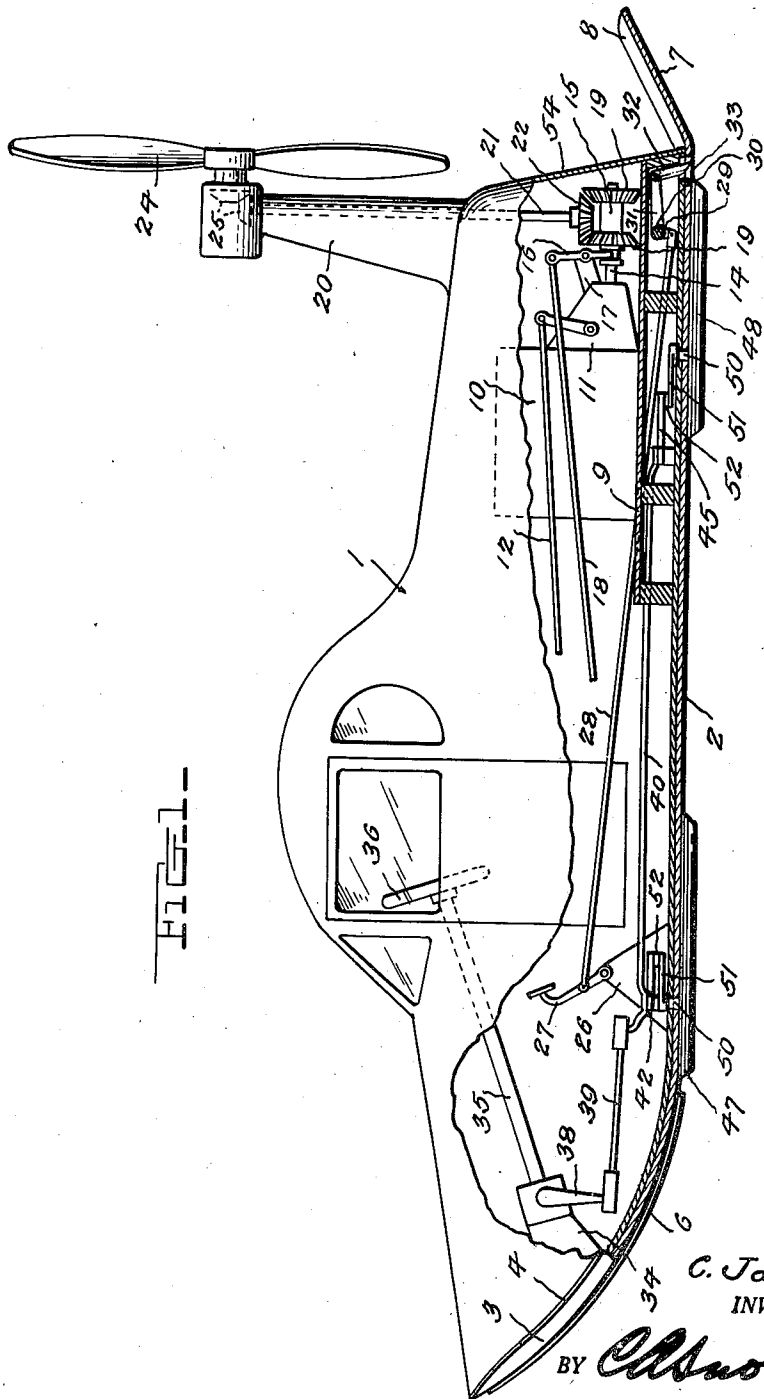
C. JAMES

2,276,310

SNOW BOAT

Filed Aug. 2, 1940

4 Sheets-Sheet 1



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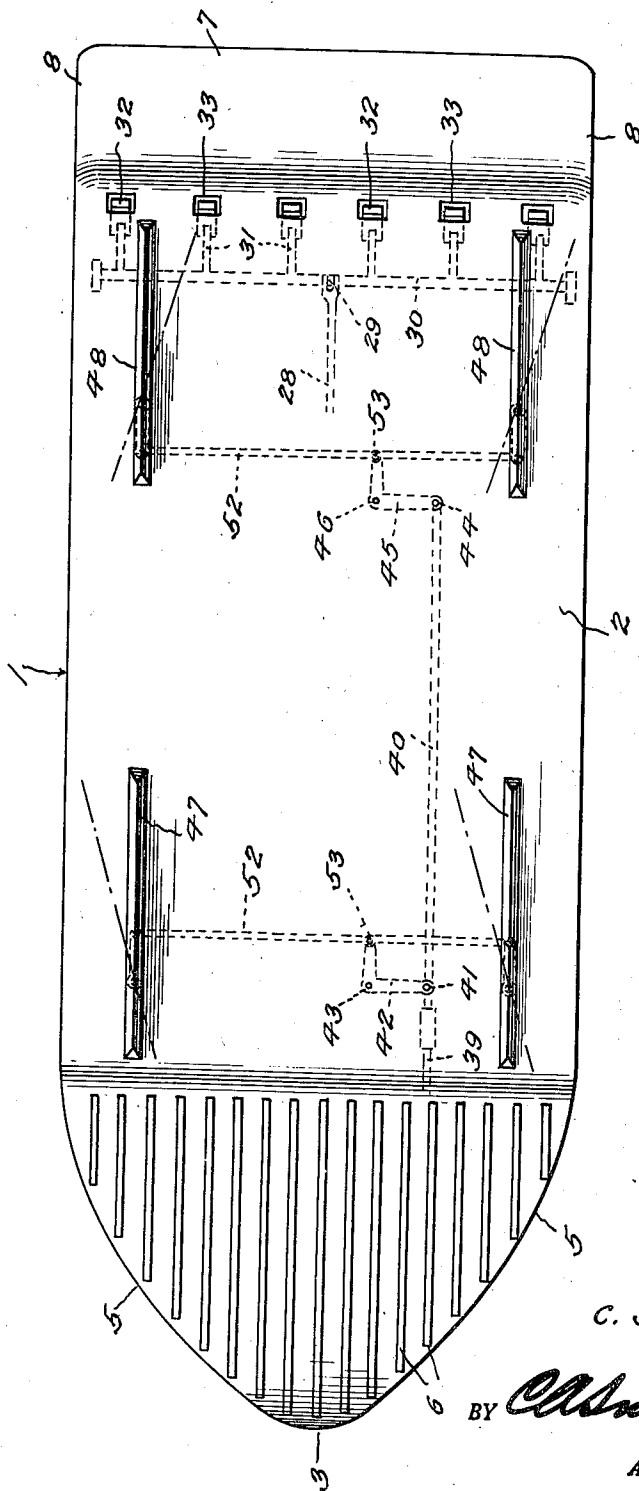
2,276,310

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FIG. 2.



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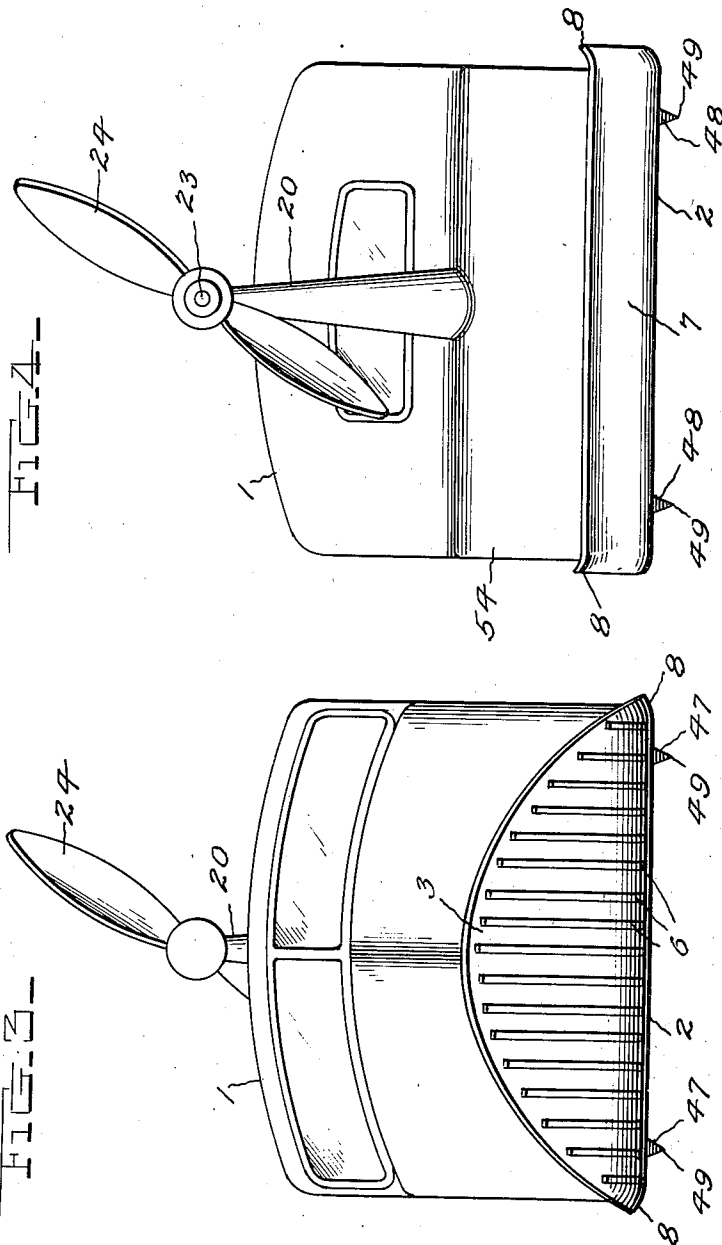
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2,276,310

SNOW BOAT

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4 Sheets-Sheet 3



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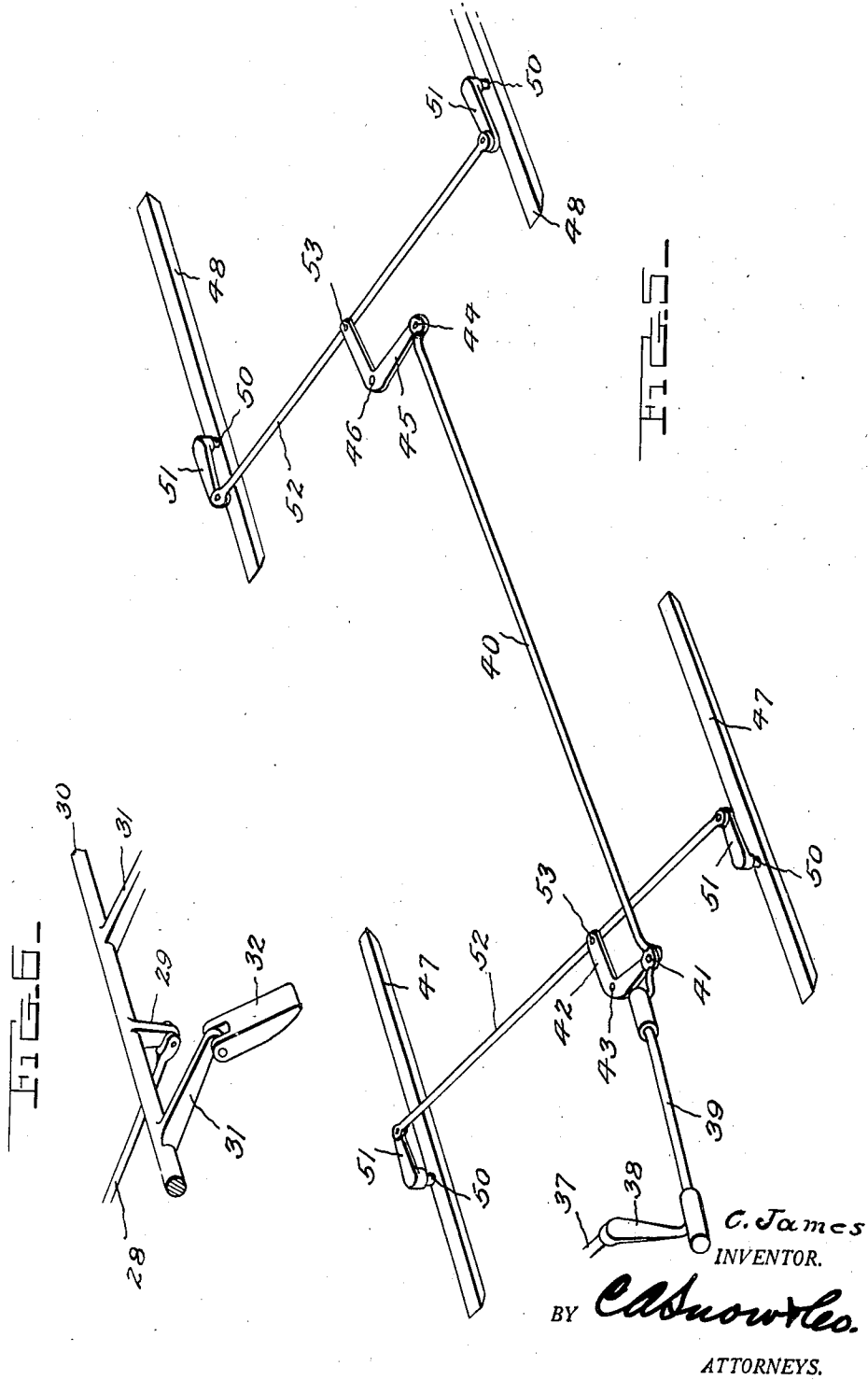
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SNOW BOAT

Filed Aug. 2, 1940

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,276,310

SNOW BOAT

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Application August 2, 1940, Serial No. 349,621

2 Claims. (Cl. 180—3)

The device forming the subject matter of this application is a vehicle adapted to be propelled over snow or ice. The invention aims to provide novel means for propelling the boat, novel means for steering the boat and holding it on a course and to provide novel means for mounting and actuating the movable parts.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 shows in side elevation, a snow boat constructed in accordance with the invention, parts being broken away;

Fig. 2 is a bottom plan;

Fig. 3 is a front end elevation;

Fig. 4 is a rear end elevation;

Fig. 5 is a perspective view illustrating most of the steering mechanism;

Fig. 6 is a perspective view showing a portion of the brake mechanism.

The snow boat forming the subject matter of this application may be made of any selected materials or combination of materials, and it comprises a body 1, shown as of the closed type, but not necessarily so. The body 1 includes a substantially flat bottom 2, comprising a prow 3, which is upwardly and forwardly inclined, as shown at 4 in Fig. 1, the prow being forwardly tapered, as indicated at 5 in Fig. 2. Fore and aft keels 6 are secured to the prow 3 and are spaced apart transversely, the keels increasing in length from the sides of the snow boat to the longitudinal center thereof. The keels 6 terminate at their rear ends approximately at the place where the upwardly inclined prow 3 merges into the bottom 2. The keels 6 aid in keeping the snow boat on a course, particularly when the boat is traversing snow, as distinguished from ice.

The after end of the bottom 2 is upwardly inclined, to fashion a stern piece 7, having upwardly and transversely inclined flanges 8 at its outer edges. Owing to the general upward and rearward slant of the stern piece 7, the stern piece will move over the snow without causing too much

drag, but at the same time, the body 1 will be prevented from squatting at its after end. The upwardly inclined flanges 8 prevent too much drag at the longitudinal edges of the stern piece 7.

As shown in Fig. 4, the flanges 8 extend outwardly beyond the sides of the body 1, thereby to reduce the amount of snow displaced by the stern piece 7 and tending to swirl and lodge upon the stern piece, behind the body. The propeller wheel 24, hereinafter mentioned, and in combination with other parts, tends to clear the stern piece 7 of snow: but, owing to the provision of the flanges 8, located as described, the propeller wheel is enabled to clear the stern piece 7 of snow the more readily.

A platform structure 9 is secured to the bottom 2 of the body 1, at the after end of the boat. The means for propelling the boat comprises a prime mover, such as an internal combustion engine 10, secured to the platform 9. The internal combustion engine 10 includes a speed change mechanism 11, operated by any conventional or satisfactory means 12, extended forwardly to a place where it can be manipulated conveniently by a person seated within the body 1.

The shaft 14 of the internal combustion engine 10 extends rearwardly. A sleeve 15 is splined to the shaft 14, for rotation therewith and for longitudinal movement therealong, at the will of an operator. A lever 16 is fulcrumed intermediate its ends on a bracket 17 carried by the casing of the speed change mechanism 11, or supported otherwise, the lever being supplied at its lower end with a fork, adapted to engage a collar on the forward end of the sleeve 15, in a well known manner. The lever 16 is operated by any suitable means 18, extended forwardly to a place where it can be manipulated readily by a person in the body 1 of the snow boat.

The body 1 includes a rear end wall 54 which is located directly below a propeller 24 which constitutes means for advancing the snow boat. The end wall 54 is downwardly and rearwardly inclined to the stern piece 7. The result is that the wall 54 directs air from the propeller 24 downwardly on the stern piece, and the stern piece is freed from snow to a very large extent. The stern piece 7, therefore, is not loaded with snow, producing an increased weight and a corresponding drag at the rear end of the boat.

A pedestal 20 is rigidly erected on the body 1 close to the after end thereof, and in the pedestal 20, a substantially vertical driven shaft 21 is journaled for rotation. A beveled gear 22 is se-

cured to the lower end of the driven shaft 21, and, at the will of an operator, can mesh with either of a pair of pinions 19 secured to the sleeve 15. The aforesaid propeller 24 is secured to a propeller shaft 23, journaled in the upper part of the pedestal 20, the propeller shaft being operatively connected to the driven shaft 21 by intermeshing beveled gears 25, housed within the pedestal 20.

As to the means for checking the advancing movement of the snow boat, particularly when it is used upon ice, Figure 1 shows that a support 26 is secured to the bottom 2 of the body 1 in the vicinity of the forward end of the body, a pedal 27 being pivotally mounted on the support. To the pedal 27 is pivoted a backwardly extended link 28, passing slidably through the platform structure 9. The rear end of the link 28 is pivoted to a short depending finger 29 (Fig. 6) on a transverse shaft 30, supported for rocking movement on bearings carried by the body 1, or otherwise. The shaft 30 has transversely spaced, rearwardly extended arms 31, whereunto are pivoted downwardly extended and rearwardly inclined drag shoes 32, passing through openings 33 in the after end of the bottom 2, the drag shoes having a rearward bearing against the body 1 and the platform structure 9, as indicated in Fig. 1 of the drawings.

As to the steering mechanism, a bearing 34 (Fig. 1) is secured to the prow 3, an upwardly and rearwardly inclined steering shaft 35 being journaled at its forward end in the bearing. At its rear end, the steering shaft 35 is provided with a hand wheel 36 or equivalent structure, conveniently accessible to an occupant of the body 1.

The shaft 35 operates a cross shaft 37, shown in Fig. 6, the cross shaft being supplied with a depending crank arm 38, to which is pivoted the forward end of a drag link 39. The rear end of the drag link 39 is pivoted to the forward end of a rearwardly extended connecting rod 40, slidable in the platform structure 9.

The forward portion of the connecting rod 40 is pivoted at 41 to a forward bellcrank lever 42, fulcrumed at 43 on the bottom 2 of the body 1. The rear end of the connecting rod 40 is pivoted at 44 to a rear bellcrank lever 45, fulcrumed at 46 on the bottom 2 of the body 1.

Forward steering fins 47 are disposed beneath the bottom 2 of the body 1, at the place where the bottom merges into the prow 3, the fins being in contact with the bottom. Rear steering fins 48 are similarly mounted with respect to the bottom 2 and are located close to the after end of the snow boat. The fins 47 and 48 taper downwardly to a reasonably sharp edge 49, shown in Fig. 4. The fins 47 and 48 do not serve as runners, when the device is used in snow, the weight of the entire structure being carried on the bottom 2; but when the boat is used on ice, the fins of course acquire a firm hold on the ice and, then, carry the weight of the body, if the ice is slick and free from snow.

Intermediate their ends, the steering fins 47 and 48 are provided with shafts 50, mounted to rotate in the bottom 2 of the body 1. The shafts 50 are supplied with crank arms 51, pivoted to the ends of rigid cross connections 52. The rearwardly extended arms of the bellcrank levers 42 and 45 are pivoted at 53 to the intermediate portions of the cross connections 52.

As to the propulsion of the boat, the internal combustion engine 10 drives the shaft 14, one of the pinions 19 rotates the driven shaft 21, the beveled gears 25 operate the propeller shaft 23, and rotation is imparted to the propeller 24.

By means of the mechanism shown at 16—18, the sleeve 15 can be shifted fore and aft, and the appropriate one of the pinions 19 may be brought into mesh with the beveled gear 22. In this way, the snow boat can be driven ahead or set aback, the stern piece 7 then serving as a prow.

A speed change is brought about by the mechanism shown at 11—12, in a common and well known manner.

In order to check the advancing movement of the snow boat, or the rearward movement thereof, the pedal 27 is actuated, the link 28 and the finger 29 rotate the shaft 30, and the arms 31 advance the shoes 32 into working position.

Steering is brought about by a train of parts including the hand wheel 36, the steering shaft 35, the shaft 37 of Fig. 6, arm 38, the drag link 39, the connecting rod 40, the bellcrank levers 42 and 45, the cross connections 52, the crank arms 51, and the short shafts 50 which are carried by the steering fins 47 and 48.

The device is simple in construction, but will be found thoroughly efficient to carry out the objects set forth in the opening portion of this specification. The construction is such that little attention need be given to upkeep, and repairs do not call for the skill of a highly trained machinist. The snow boat will hold its course readily and will not yaw. The construction at the bow and at the stern is such that friction will be reduced to a practical minimum.

Having thus described the invention, what is claimed is:

1. A snow boat comprising a body, a rearwardly extended and upwardly inclined stern piece at the rear end of the body, and driving means for the body, including a propeller wheel mounted to rotate about a substantially horizontal axis, the body having a plate-like rear end wall located directly below the propeller wheel and extended upwardly to a place closely adjacent to the periphery of the propeller wheel, the rear end wall being inclined downwardly and rearwardly to the stern and being substantially as wide as the stern piece, to direct air from the propeller on the stern piece and free it from snow, the stern piece constituting means for limiting the squatting of the body at its rear end.
2. A snow boat comprising a body having a substantially flat bottom provided at its rear end with a stern piece which is as wide as the body, to reduce squatting at the rear end of the body, the stern piece being upwardly and rearwardly inclined, to minimize drag, the stern piece being provided along its outer longitudinal edges with flanges which are upwardly inclined, to reduce drag at the sides of the stern piece, the flanges extending outwardly beyond the sides of the body, thereby to reduce the amount of snow displaced by the stern piece and tending to swirl and lodge upon the stern piece, behind the body, and keels carried by the bottom of the body, and of so little height that the bottom of the body can ride on a snow surface.

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