(No Model.)

2 Sheets—Sheet 1.

J. T. FISHER.

PROPULSION OF VESSELS.

No. 464,621. Patented Dec. 8, 1891.

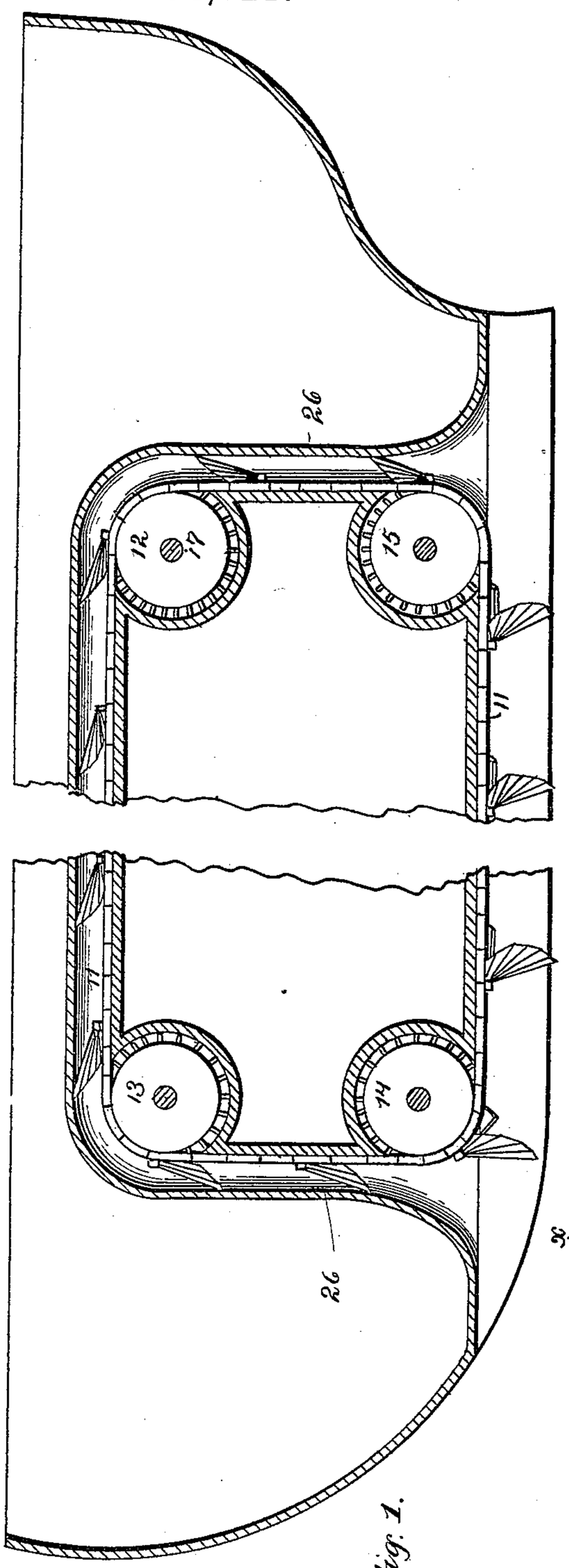


Fig. 1.

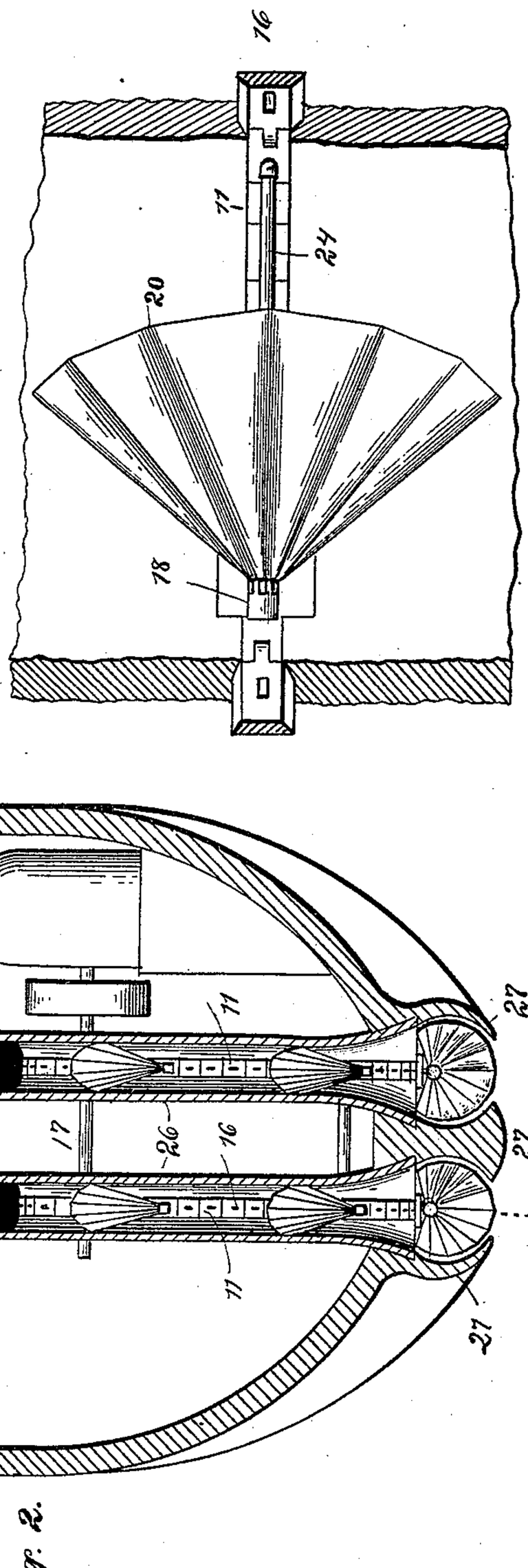


Fig. 3.

Fig. 2.

WITNESSES.
Victor J. Evans
N. S. Amsbury

INVENTOR.
John. T. Fisher.
By H. T. Fisher.
ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

J. T. FISHER.

PROPULSION OF VESSELS.

No. 464,621. Patented Dec. 8, 1891.

Fig. 4.

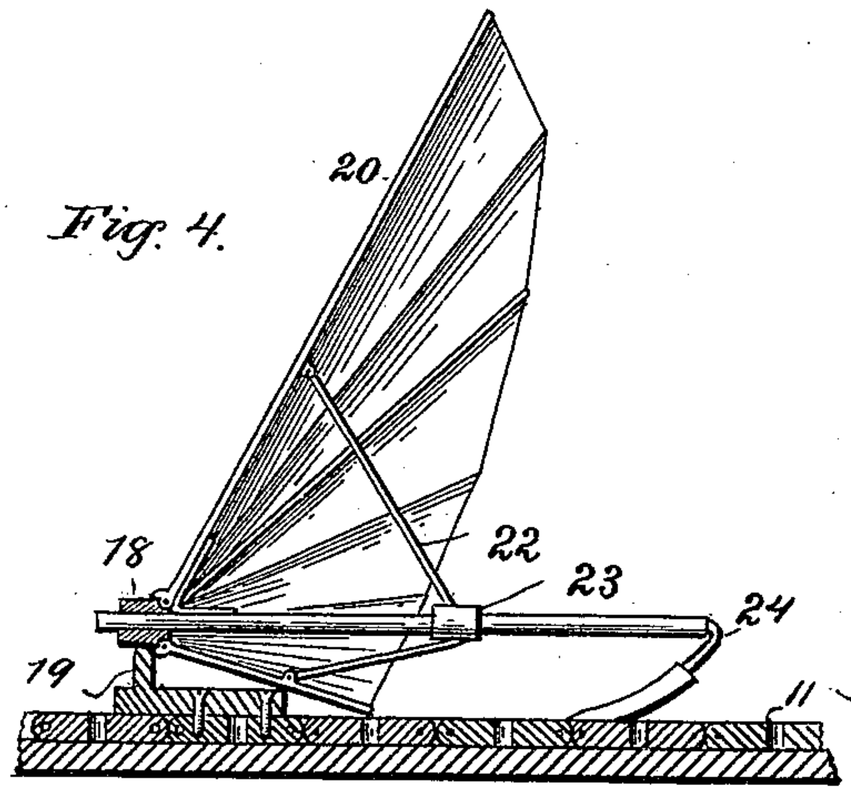


Fig. 5.

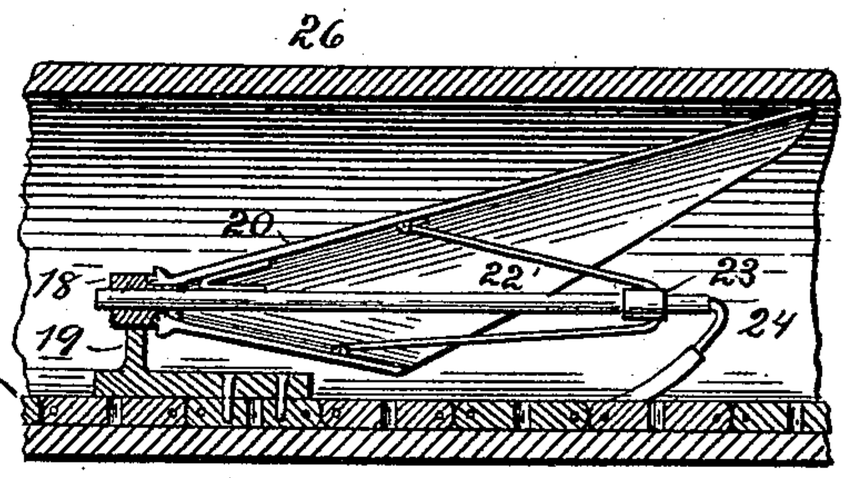


Fig. 6.

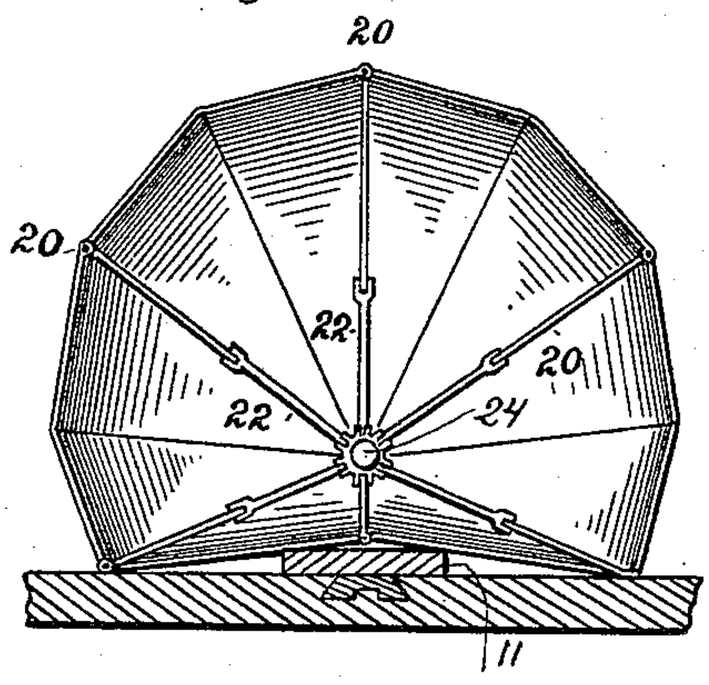


Fig. 7.

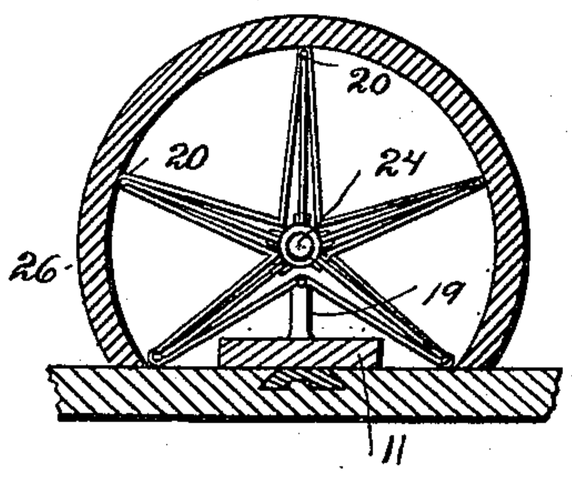


Fig. 8.

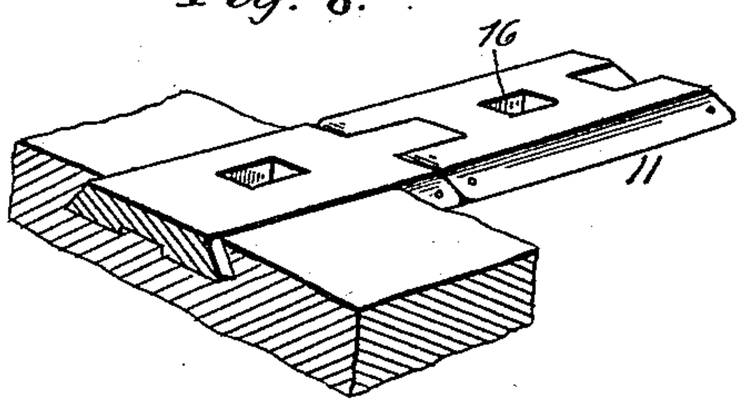


Fig. 9.

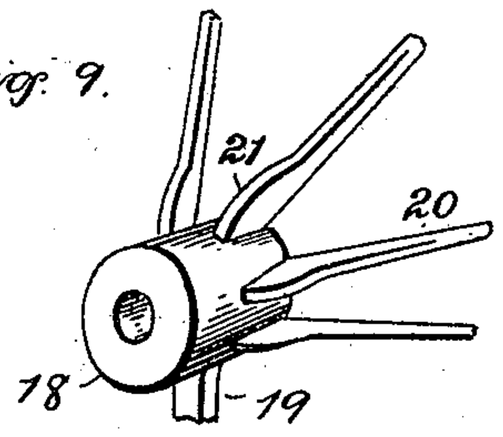
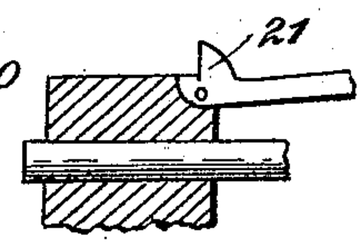


Fig. 10.



WITNESSES.
Victor J. Evans.
N. S. Amstutz

INVENTOR.
John. T. Fisher.
By H. T. Fisher.
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN T. FISHER, OF CLEVELAND, OHIO.

PROPULSION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 464,621, dated December 8, 1891.

Application filed April 30, 1891. Serial No. 391,028. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. FISHER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Means for Propelling Boats and other Vessels; 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 which it appertains to make and use the same.

My invention relates to means for propelling boats and other vessels; and the invention consists in the construction substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a boat broken out in the center to bring the same within the limits of the drawings and showing my improved mechanism for propelling the same. Fig. 2 is a transverse section of the boat on a line corresponding to *x x*, Fig. 1. Fig. 3 is an enlarged plan view of one of the propellers or vanes shown in connection with a fragment of the endless chain to which the same is attached. Fig. 4 is a longitudinal central section of one of said vanes as it appears when fully opened as in work. Fig. 5 is a longitudinal section of the vane shown as closed or folded and as it appears in the tube in which it travels. Fig. 6 is a front elevation of one of the vanes and a cross-section of the chain and support therefor corresponding to a view looking in from the right of Fig. 4, excepting that in this instance the entire vane is shown. Fig. 7 is a front elevation of the said vane folded in the tube in which it travels. Fig. 8 is an enlarged sectional view of the endless chain, and showing a section of the base or support in which it slides. Fig. 9 is a perspective view of one of the vane-hubs, showing several of the ribs pivoted thereon and as open. Fig. 10 is a longitudinal section of the hub, showing one of the ribs as in closed position.

The invention herein disclosed is adapted to boats or vessels of any size, and the propelling mechanism is designed to be run by suitable power connections from a steam-engine, electric motor, or other means of applying or generating power.

The vanes or propellers are attached to an endless chain 11, consisting of a series of peculiarly-constructed links adapted to be engaged by sprocket-wheels 12, 13, 14, and 15, arranged and operating as hereinafter described. The said links have recesses or openings 16 at intervals, which are engaged by the teeth on the sprocket-wheels, and a power-shaft 17, Fig. 2, is shown, by which said wheels and chains are actuated.

The construction of the vanes is a peculiar one, and resembles that of an ordinary umbrella in its general make-up. For this purpose each vane has a hub 18, secured upon a post 19, rigid with one of the links of the chain, and from this hub project a series of ribs 20, corresponding to the ribs of an umbrella and pivotally attached to the said hub. The said ribs have shoulders 21, which rest against the hub when the bucket is opened and prevent further opening, and each rib has a stay-rod 22, as in an umbrella, connected with the sliding sleeve 23 on a fixed stem, pole, or rod 24, socketed in the hub 18. A suitable covering 25, corresponding to the covering of an umbrella and made of any suitable material, is fixed upon this framework and is made of such strength and quality as to withstand the use to which it is applied. For small boats, heavy canvas or duck will do. It will be observed, however, that the said vane is cut away from its bottom diagonally toward its top and that the ribs 20 are correspondingly shortened from the top downward upon both sides, giving the vane in side elevation somewhat the outline of a scoop or a fan bent around at the sides.

The rod or stem 24, it will be understood, is rigid, and the sleeve 23 is free to slide thereon to open or close the vane, as may be required. As many of these vanes are attached to the endless chain as may be found necessary, the number depending somewhat upon the size of the vessel and other conditions. Their size, likewise, will depend upon the size of the vessel, ranging from five or six inches to several feet across the front.

The chain and vanes thus constructed and connected are placed upon the four several sprocket-wheels and upon a grooved guideway therefor, as shown in the several figures. Thus, in order that the circuit may be de-

scribed and the vanes brought into operative position in their order, I form a channel 26, circular in cross-section and flat at its bottom, in which is a dovetailed groove adapted to receive the corresponding dovetailed links of the chain. The links remain in this dovetailed channel in making the entire circuit shown, and the said circular channel 26 extends up from the bottom of the boat a sufficient distance and across at the top and down at the front, the four sprocket-wheels being set in the four angles of this channel so as to engage the carrying-chain at each angle. Power being applied and the chain carried forward, the vanes as they emerge from the grooved channel 26 at the front of the vessel expand immediately upon striking the water and speedily come into action to force the vessel forward, it being understood of course that the vanes are carried by the driving power in the direction opposite to the travel of the boat. They remain thus expanded and in condition to work while they travel from one end to the other of the bottom of the boat, and when they reach the corner of the channel in which the sprocket-wheel 15 is located they strike the rounded face of the channel and are mechanically closed. Their function of course ceases when they make the turn at the corner 15, and as one disappears up the channel at this point another will appear at the front, so that a regular succession of vanes and a corresponding number will at all times be kept at work. In order that the said vanes may not be injured by grounding of the vessel, suitable guards 27, which serve also as guideways and which conform to the rounded shape of the vanes when opened are fixed upon the bottom of the vessel. The vanes are thus perfectly protected wherever they may be located in the circuit, and by reason of the dovetailed guideway in which the chain travels at the bottom of the vessel, as well as at other points in its circuit, the said chain is prevented from sagging and is held in the proper position to take the full head of water for which they are intended. By these means an extraordinary amount of force for propelling a boat or vessel may be applied at a place where the work can be most effective and where the greatest possible service can be rendered, and I am enabled to propel a vessel with remarkable speed and with more than ordinary ease and safety.

I have shown two sets of vanes with corresponding channels for the same; but one or more sets may be used, according to the size of the vessel. For small vessels the guide-rod 24 in the vane may be dispensed with. The housing about the vanes at the bottom is such as to afford the most ample protection, and yet is open in the bottom in such way as to give the vanes the fullest and freest access to the water. Power may be applied to one or more of the sprocket-wheel shafts and to any one that is most convenient. In the larger vanes suitably constructed and arranged metal plate covering can be advantageously used.

The size of the tube in which the vanes fold will depend largely on the construction of the vane, and if a number of narrow blades or strips be employed between the ribs, instead of one or two, the folding will be correspondingly more compact. Thus two are used, as shown in Figs. 6 and 7, and only half this space would be needed if four instead of two strips were used between the ribs. The same is true of the use of canvas, duck, or the like; but the views here shown serve to illustrate the nature and operation of the invention.

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

1. The vane herein described for a propeller, flaring from its rear toward its front and shortened at the front from top to bottom, substantially as described.

2. The endless chain having rigidly-attached hubs at intervals and a guide-rod parallel with said chain, in combination with folding vanes supported on said hubs and guide-rod, substantially as described.

3. The endless chain, hubs provided with supporting-posts rigid with the chain and guide-rods rigid with said hubs, in combination with the vanes having ribs of gradually-increasing length from bottom to top, a sliding sleeve on said guide-rod, and stays connecting the ribs of the vanes with said sleeves, substantially as described.

4. The endless chain provided with rigidly-attached hubs at intervals, in combination with vanes wholly on one side of the chain and pivoted on said hubs, and guide-rods for said vanes fixed to said hubs, substantially as described.

5. A boat or vessel provided with propelling mechanism, consisting of an endless chain having flexible vanes at intervals wholly on one side of the chain, in combination with the boat-bottom having a grooved guideway in which the said chain is confined and travels, substantially as set forth.

Witness my hand to the foregoing specification this 17th day of April, 1891.

JOHN T. FISHER.

Witnesses:
H. T. FISHER,
N. L. MCLANE.