

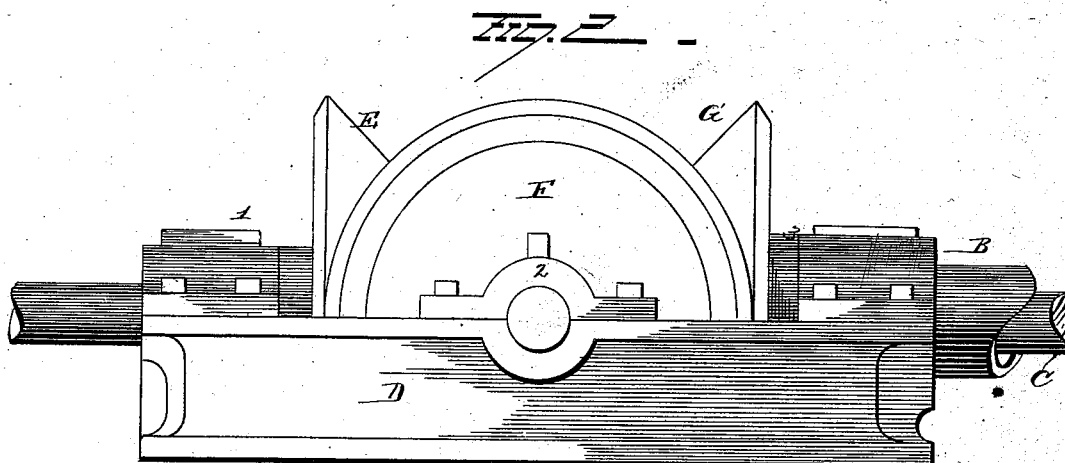
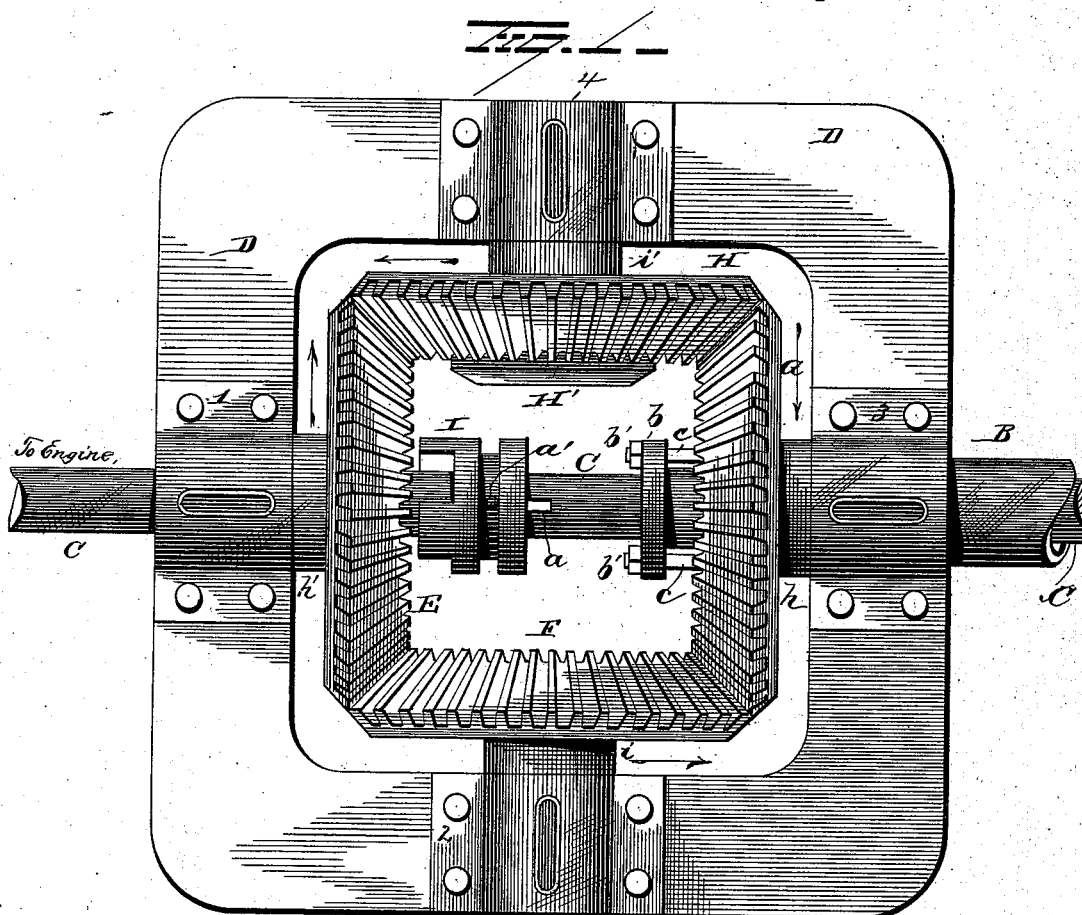
(No Model.)

2 Sheets—Sheet 1.

J. S. BISHOP.
PROPELLER WHEEL.

No. 381,104.

Patented Apr. 17, 1888.



Witnesses
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G. F. Downing

Inventor
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By his Attorney
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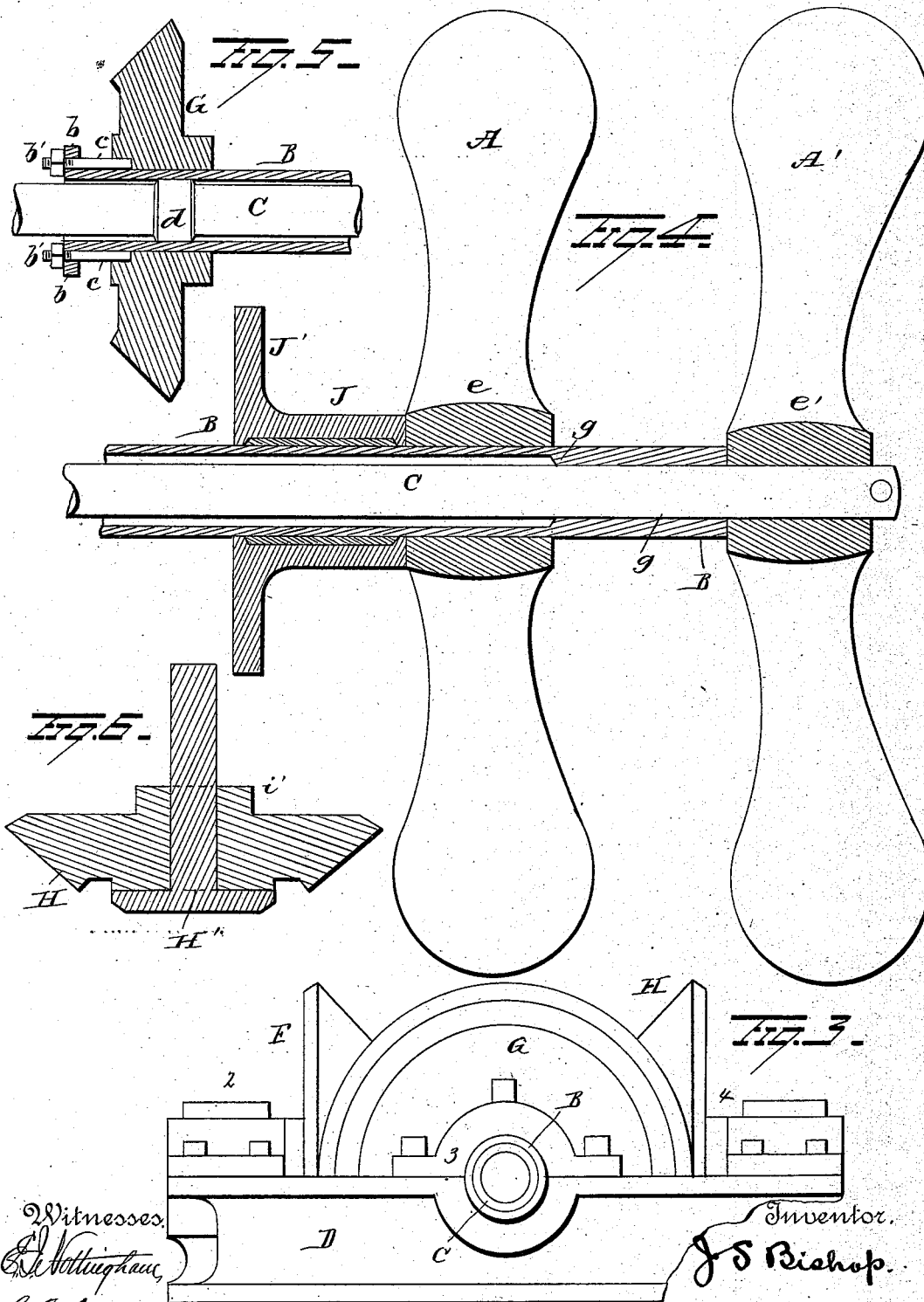
(No Model.)

2 Sheets—Sheet 2.

J. S. BISHOP.
PROPELLER WHEEL.

No. 381,104.

Patented Apr. 17, 1888.



Witnesses
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C. F. Downing

By his Attorney
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Inventor.
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UNITED STATES PATENT OFFICE.

JASON S. BISHOP, OF OLEAN, NEW YORK, ASSIGNOR OF ONE-HALF TO FRANK W. HIGGINS, OF SAME PLACE.

PROPELLER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 381,104, dated April 17, 1888.

Application filed December 14, 1887. Serial No. 257,861. (No model.)

To all whom it may concern:

Be it known that I, JASON S. BISHOP, of Olean, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Propeller-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in propeller-wheels and their operating-gear.

The object of my invention is to increase the speed of boats; and to do this I provide a simple, compact, and practical mechanism for the operation of two propeller-wheels in the same axial line, (one being a right-handed wheel and the other a left,) and in a manner to permit them to rotate in opposite directions, one in the rear of the other.

A further object is to furnish a means for the operation of two propeller-wheels in the same axial line, or one in rear of the other, the operating mechanism being arranged to permit the arrest of motion of one wheel while the other is operated, and also allow the resumption of rotation by the idle-wheel when desired, so that one or both wheels may be used, as the needs of the service may dictate.

With these objects in view my invention consists in certain features of construction and combinations of parts, that will be hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a plan view of the bed-plate and gearing by which the wheels are operated, exhibiting the manner of attachment of the shafts to the gearing, portions of the shafts being also shown. Fig. 2 is a side elevation of the bed-plate with the wheel-gearing and adjacent portions of the shaft shown in position. Fig. 3 is an end elevation of the bed-plate and gearing, taken from the side of the bed-plate nearest the engine. Fig. 4 represents a longitudinal section of portions of the wheel-shafts with the wheels located upon their respective shafts. Fig. 5 is a sectional view of one of the gear-wheels and portions of the two shafts, taken on the axial center line of the shafts; and Fig. 6 is a detached

sectional view of one of the intermediate gear-wheels.

A A' are two propeller-wheels that are made in the best approved manner known to the art and provided with any suitable number of blades, the length of which will be proportioned to the demands of the service to be performed, to afford greater or less propelling-power. The blades of each wheel A A' radiate from their respective hubs *e e'*, which latter are perforated lengthwise to allow the wheels to be mounted upon their shafts. The forward wheel, A, or one located nearest the stem of the vessel on which the wheels are to be employed, is secured upon the body of a hollow shaft, B, (see Fig. 4,) the inner surface of the hub of the wheel A having contact with a flanged box-bearing, J, the flange J' of which is secured to proper timbers of the vessel to give a stable support to the hollow shaft B, which is inserted through the box and has a true surface provided where contact is had with the bore of said box.

Outside of the wheel A the shaft B is projected sufficiently to afford a proper space between the forward wheel, A, and the rear or outer wheel, A', this latter-named wheel being mounted upon and firmly secured to a solid shaft, C, which is inserted through the hollow shaft B, the adjacent face of the hub *e'* of the wheel A' having a true surface to bear against the trued end of the hollow shaft when the parts are in position to operate.

There is a bearing, *g*, formed for contact of the solid shaft C in the end of the hollow shaft B, (see Fig. 4,) the hollow shaft being enlarged in its caliber inside of this bearing to prevent excessive frictional contact of the two shafts with each other.

At a desirable point within the hull of the vessel to which the wheels are adjusted a bed-plate, D, is mounted and secured on any suitable foundation to rigidly retain it in its place. The bed-plate D is preferably made of metal, and is shown in Figs. 1, 2, and 3 of the drawings. It consists, essentially, of a square frame, on the four sides of which are formed journal-boxes 1 2 3 4 at points midway between the corners of the frame or bed-plate.

The boxes 1 3, which are opposite each other, are intended to give support to the shafts B C. The box 3, which is on the side of the bed-plate D nearest the stem of the boat, is made of a capacity to receive the outer hollow shaft, B, the surface of which is rendered true where it enters this box.

The bed-plate D has a rectangular opening or space formed in it of sufficient dimensions to receive the gear-wheels which are used to transmit motion and power from the solid shaft C to the hollow shaft B and its attached propeller-wheel A, as will be further explained.

The outer or hollow shaft, B, has a bevel gear-wheel, G, attached to it by the stud-bolts *c*, which are secured in the face of the wheel and enter holes in the flange *b*, formed on the end of the shaft, the nuts *b'* serving to draw the wheel toward the flange by their threaded engagement with the studs *c* and pressure upon the outer surface of the flange *b*, as shown in Figs. 1 and 5.

In Fig. 5 will be seen the plan of construction of the inner solid shaft, C, where it is in contact with the hollow shaft B. Near the inner end of this shaft an enlargement or swell, *d*, is produced on the solid shaft C that is of proper diameter to fit against the interior surface of the hollow shaft B, to hold the latter concentric with the solid shaft and yet permit it to revolve.

The position of the bevel gear-wheel G on the shaft B will locate its faced hub *h* in running contact with the inner face of the box 3, the wheel having freedom to revolve in the opening of the base-plate D.

In the boxes 2 4 of the bed-plate D the intermediate bevel gear-wheels, F H, are supported upon short journal-shafts H' (see Fig. 6,) which are secured in these wheels, the journals fitting the boxes to permit a rotative movement of the wheels, which are of proper diameter and pitch to mesh their teeth with teeth of the wheel G upon each side of the same.

The solid shaft C, on which is secured the rear propeller-wheel, A', extends through the box 1 of the base-plate D, and has a bevel-wheel, E, loosely mounted on it that is in meshed contact with the intermediate wheels, F H. (See Fig. 1.) The shaft C is slotted through the center of its body at a point between the two wheels G and E, this slot *a* being of sufficient length to allow the clutch-hub I to be slidably secured to the shaft C by a cross-pin, *a'*, inserted in it and through the slot; or a keyway may be cut in one side of the shaft C longitudinally, in which a feather-key that is fitted and fastened in the clutch-hub I may be located so as to permit a sliding movement of the clutch-hub.

A concentric groove, *m*, made in the clutch-hub I, may be engaged by a croched lever, in a manner usual to such devices, to afford means for the shifting of the clutch-hub into contact with locking ears or projections formed on the adjacent face of the wheel E, or, if preferred, into holes or recesses made in this face

of the wheel to lock it fast to the shaft C, or throw it out of connection with the shaft, if desired.

In service it will be apparent that power which is applied to the inner end of the solid shaft C will rotate the rear propeller-wheel, A', which is farthest removed from the stern of the vessel, and if the clutch-hub I is disengaged from the wheel E the other wheel, A, will not be moved.

When it is desirable to use both propeller-wheels A A', the clutch-hub I is shifted to lock the shaft C with the loose wheel E. This will transmit the motion it derives from this connection with the shaft C through the intermediate wheels, F H, to the bevel gear-wheel G, and consequently to the inner propeller-wheel, A, which will rotate in a direction opposite to that given to the outer propeller-wheel, A'.

It is a well-known fact that the operation of a single propeller-wheel causes a side motion, and when a straight course is desired the rudder-blade has to be held in a certain fixed position to prevent the boat from taking a circuitous route. This necessarily retards the speed of the boat. It also causes an injurious side wear on the supporting-boxes of its shaft, as well as a considerable loss of power from friction, which is due to the lateral thrust of the blade of the wheel. In my improved method of construction I overcome this side-thrust when both wheels are in use, as by the revolution of the wheels in opposite directions the action of one will balance the other and frictional resistance of the shafts in their boxes will be reduced to a minimum.

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

1. In propelling mechanism for boats, the combination, with a support, a hollow shaft journaled therein and carrying a propeller-wheel, and a solid shaft journaled in said support and in the hollow shaft and carrying a propeller-wheel, of a gear-wheel secured to one shaft, a gear-wheel loosely mounted on the other shaft, and a sliding clutch loosely mounted on the solid shaft for locking the said loose wheel to the shaft, substantially as set forth.

2. In propelling mechanism for boats, the combination, with a bed-plate, a hollow shaft journaled therein and carrying a propeller-wheel, and a solid shaft journaled in the bed-plate and in the hollow shaft and carrying a propeller-wheel, of a gear-wheel adjustably secured to one shaft, a gear-wheel loosely mounted on the other shaft, intermediate gear-wheels meshed with said wheels, and a sliding clutch-collar on one shaft adapted to lock the loose gear-wheel to its shaft, substantially as set forth.

3. In propelling mechanism for boats, the combination, with a bed-plate, a hollow shaft journaled therein and carrying a propeller-wheel, a gear-wheel adjustably secured there-

to, a solid shaft journaled in the bed-plate,
and also in the hollow shaft, and carrying a
propeller-wheel, and a gear-wheel loosely
mounted on the solid shaft, of intermediate
5 gear-wheels meshed with the said gear-wheels,
and a sliding clutch mounted on the solid shaft
and adapted to lock the loose gear-wheel to
said shaft, substantially as set forth.

In testimony whereof I have signed this
specification in the presence of two subscrib- to
ing witnesses.

JASON S. BISHOP.

Witnesses:

JOHN T. BAXTER,
H. W. MOORE.