

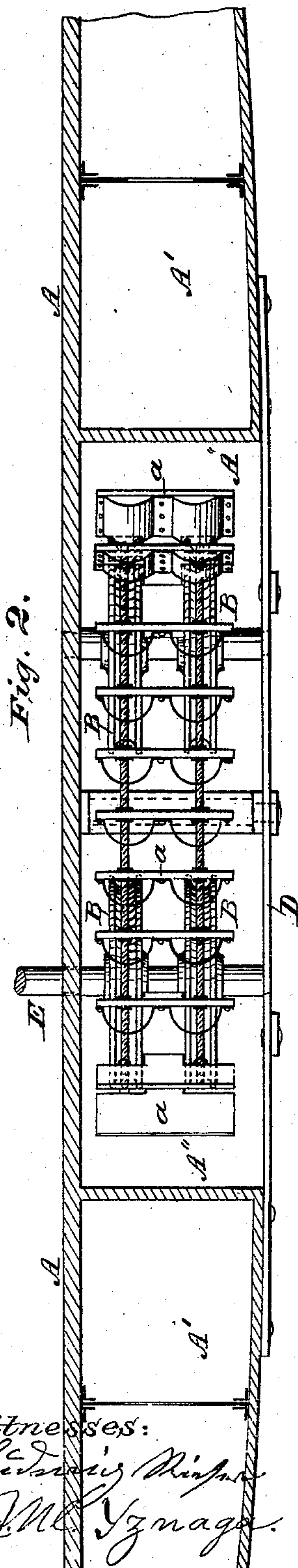
(No Model.)

2 Sheets—Sheet 1.

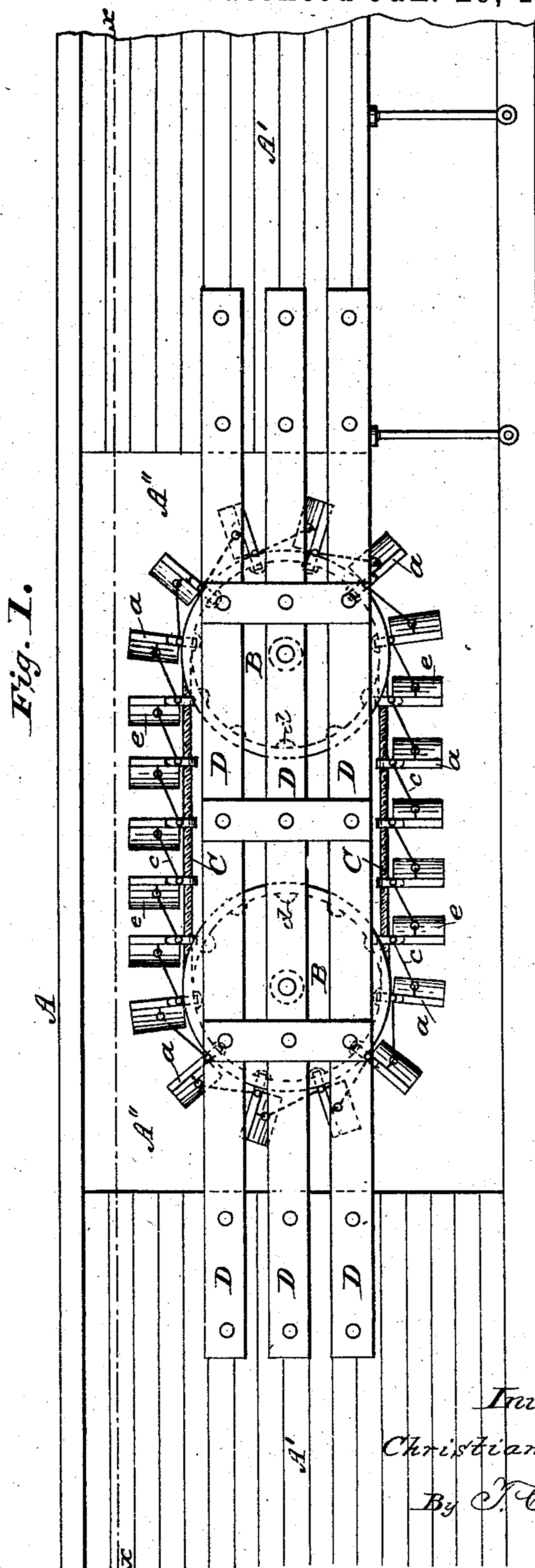
C. WORCH.
PROPULSION OF VESSELS.

No. 292,726.

Patented Jan. 29, 1884.



Witnesses:
Ludwig Muehl
J. M. Sznaga



Inventor:
Christian Worch,
By *J. C. Bruch*
Attorney

(No Model.)

2 Sheets—Sheet 2.

C. WORCH.
PROPULSION OF VESSELS.

No. 292,726.

Patented Jan. 29, 1884.

Fig. 3.

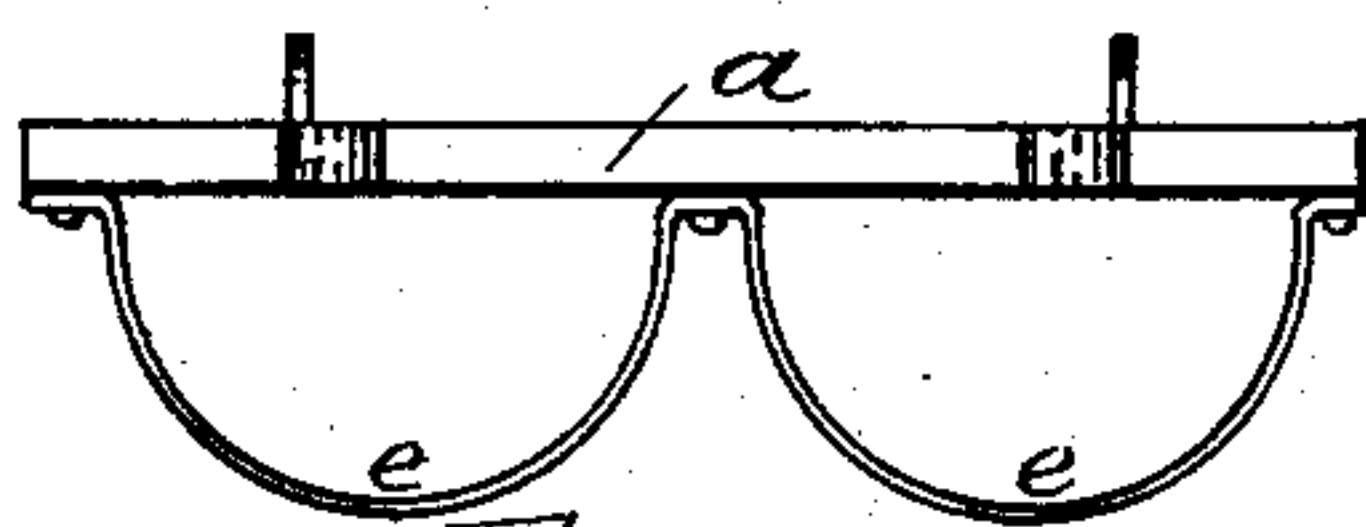
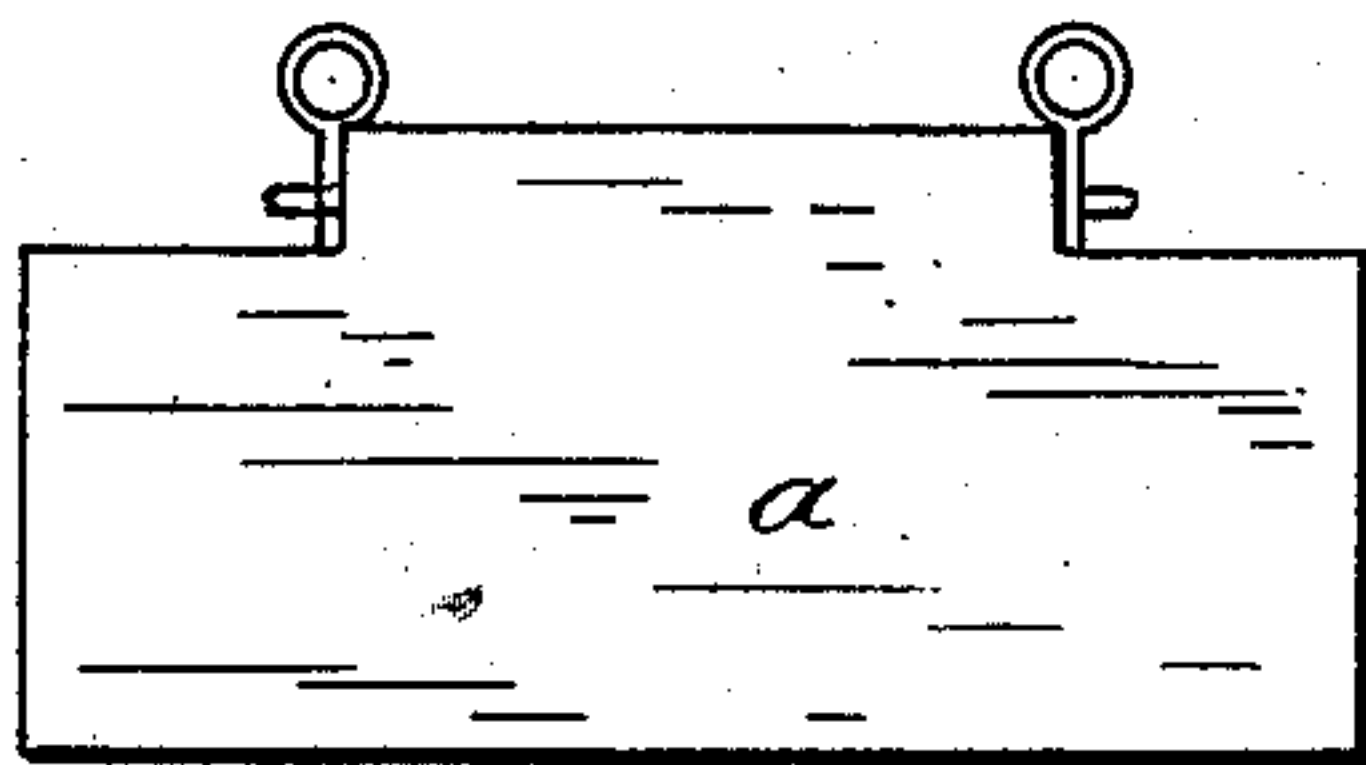
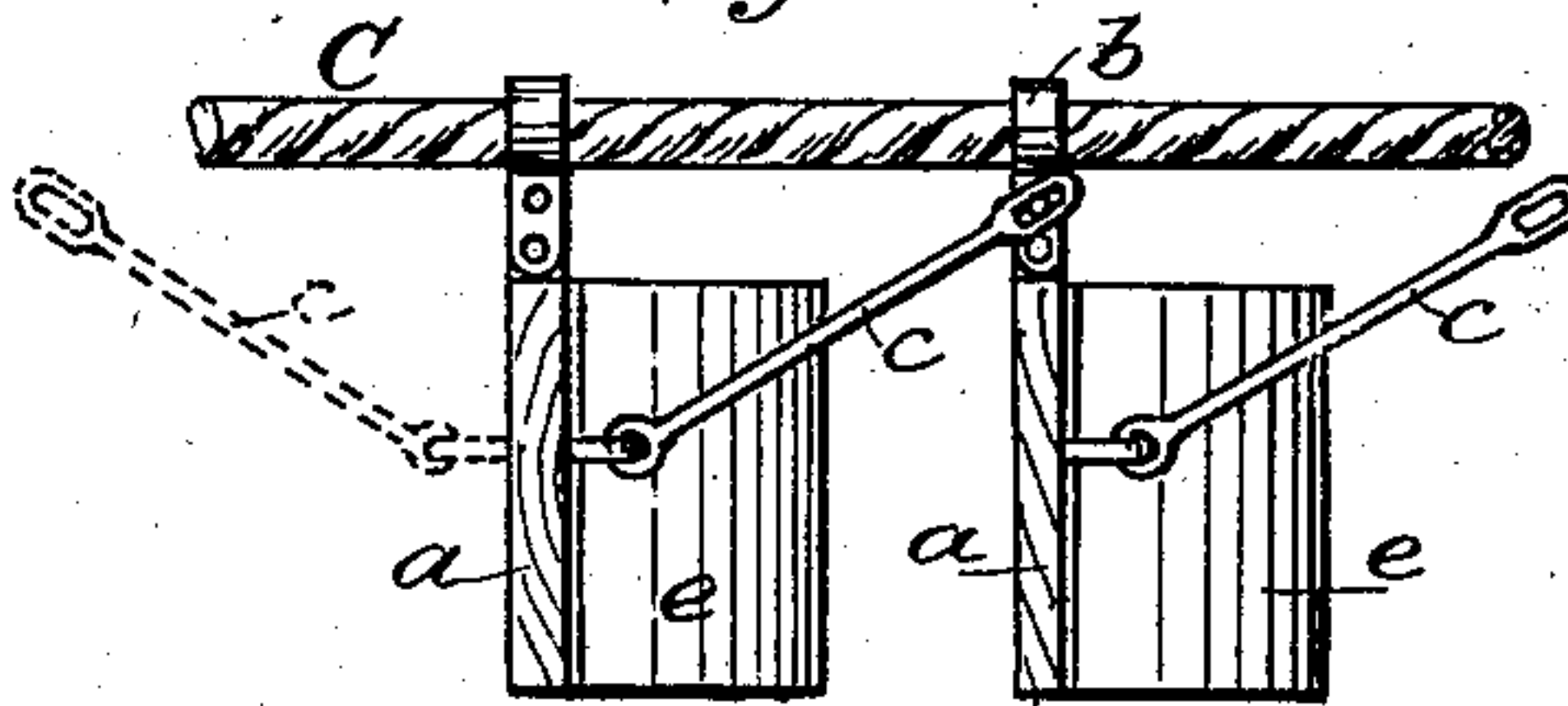


Fig. 5.

Fig. 4.



Witnesses:

Lutero Diaz,
J. M. Yznaga.

Inventor:

Christian Worch,

By T. C. Brecht,

Attorney.

UNITED STATES PATENT OFFICE.

CHRISTIAN WORCH, OF WASHINGTON, DISTRICT OF COLUMBIA.

PROPULSION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 292,726, dated January 29, 1884.

Application filed June 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN WORCH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Propulsion of Vessels; 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 improvements in means or apparatus for the propulsion of vessels of all kinds; and the object is to produce means or apparatus by which vessels can be propelled at a greater speed or velocity than has been done heretofore, and without drawing as much water as has been required ordinarily.

The invention consists of two double wheels on each side, separately connected to engines, and around said wheels revolve two endless wire ropes, provided with suitable means to engage with depressions similar to those on sprocket-wheels, and having a number of pivoted paddles attached to them.

It also consists in the construction and arrangement of certain parts, as will be more fully described hereinafter, and more specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters indicate like parts in the different figures of the drawings, in which—

Figure 1 represents a side elevation of the central part of a ship with my wheel attached. Fig. 2 is a horizontal section on line *xx*. Figs. 3, 4, and 5 are detail views of one of the paddles.

In the drawings, A represents the hull of a vessel, which is provided on its sides with water-tight bulk-heads A', properly and strongly braced in all directions. In the central part of the hull the bulk-heads are removed, and a space, A'', is formed for my oblong wheel. This consists of two wheels, B, (similar to sprocket-wheels,) around which are placed two endless wire ropes or cables, C. To these ropes are secured at proper intervals a series of paddles, *a*, by clamps *b*, and proper braces, *c*, are secured to said paddles and clamps to receive the strain from the water. They may be slotted at one end, to accommodate themselves to the radius

in passing around the wheels B. These clamps fit into notches or depressions *d* in said wheels, to prevent any slipping of the wire ropes or cables. The braces may be arranged on both sides of the paddles, as shown in dotted lines in Fig. 4. The front sides of the paddles are provided with corrugated metal pieces *e*, which enter into and grasp the water, so as to give a greater resistance to them. The shafts of the wheels B are journaled at one side in strong horizontal bars of iron D, securely braced together and firmly bolted to the ship, uniting the two ends of the space formed for the wheels, while at the same time protecting them from the action of the waves or from anything coming in contact with them. The opposite ends of the wheel-shafts are journaled in the side of the hull, and one shaft, E, extends through the side, and is connected directly to the shaft of the engine.

I prefer to employ a separate engine for each set of wheels, to facilitate the turning of the vessel, which can be done on its own center. The bulk-heads are cut away at the rear end of the wheels, to facilitate the flow of the water aft, and prevent any back action or retarding of the vessel.

The advantages of my improved oblong double wheel are that the resistance of power and momentum of the vessel are quickly overcome, as the paddles of the oblong wheel will cut and engage the water, and the resisting-power will be transferred from the ship to the paddles, and consequently they will not yield any more, and the ship is compelled to move. A much larger surface of paddles is obtained with a smaller diameter of wheels, and the speed will be correspondingly increased. The draft of the vessel can be greatly reduced, so that it can pass over shallow places in rivers or over sand bars. The wheels and general construction of my apparatus is applicable to old as well as new vessels. The decks can extend over the wheels and space for them.

I am aware that single sets of paddle-wheels with chains or ropes provided with paddles have been patented, and therefore disclaim such construction; but,

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

1. A double oblong wheel consisting of double set of wheels B, two endless wire ropes, C, and a series of paddles, *a*, arranged substantially as set forth.
- 5 2. A double oblong wheel consisting of double set of wheels B, two endless wire ropes, C, and a series of paddles, *a*, provided with corrugated pieces *e* and braces *c*, arranged substantially as specified.
- 10 3. A double oblong wheel consisting of double set of wheels B, two endless wire ropes, C, a series of paddles, *a*, secured to said ropes by clamps *b*, and provided with corrugated pieces *e* and braces *c*, in combination with wheels B, having depressions *d*, as and for the purpose 15 specified.
4. In a vessel, the combination of the double set of wheels B, endless wire ropes C, provided with a series of paddles, *a*, secured to said ropes by clamps *b*, with the protecting-bars D, 20 arranged over the sides of the space A", substantially as and for the purpose set forth.

In testimony whereof I hereby affix my signature in presence of two witnesses.

CHRISTIAN WORCH.

Witnesses:

LÜDWIG RIESER,
J. M. YZNAGA.