

(No Model.)

2 Sheets—Sheet 1.

R. KIRSCH.

SUBMERGED PADDLE WHEEL.

No. 392,346.

Patented Nov. 6, 1888.

Fig. 1.

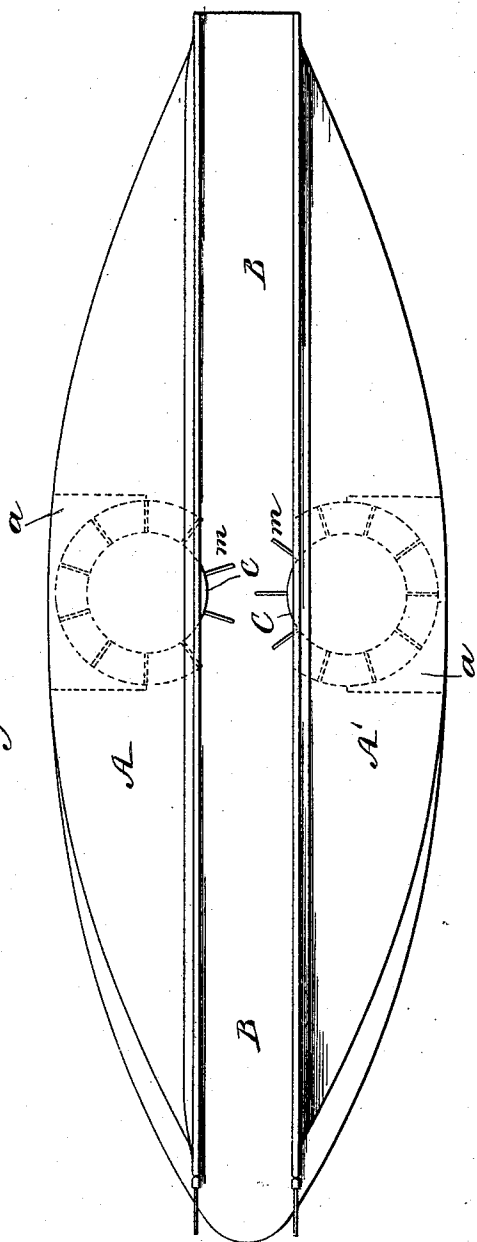
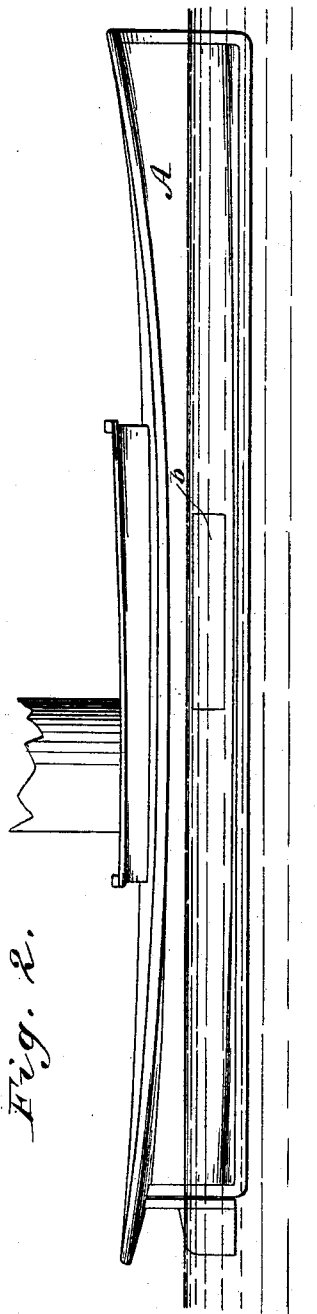


Fig. 2.



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Fig. 3.

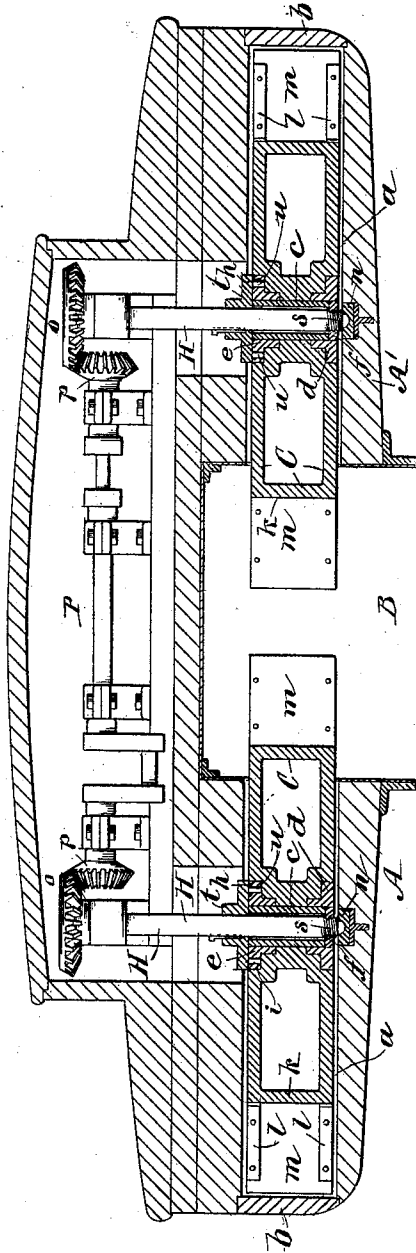
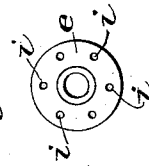


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD KIRSCH, OF BAY RIDGE, NEW YORK.

SUBMERGED PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 392,346, dated November 6, 1888.

Application filed October 29, 1885. Serial No. 181,258. (No model.)

To all whom it may concern:

Be it known that I, RICHARD KIRSCH, of Bay Ridge, in the county of Kings and State of New York, have invented a new and Improved Submerged Paddle-Wheel, of which the following is a full, clear, and exact description.

My invention relates to the propulsion of vessels and more particularly to a novel arrangement of a submerged and partially-incased paddle wheel or wheels. The principal constructive parts of the wheel or wheels are a hub, floats, or buckets projecting from the peripheral face of this hub, a central shaft with its bearings, a means for revolving the shaft, and a casing for the major portion of the wheel, within which casing the wheel may revolve freely. The wheel is so mounted that its hub and floats will be situated below the water-line, and so that the greater portion of the floats will always be out of contact with the open water, the contact therewith being destroyed by floats closing in their turn the two ends of the annular recess formed by the periphery of the hub in connection with the upper and lower defining walls and the inner face of the wheel-case. A minor portion of the hub and the floats thereon will be in free contact with the open water outside of the wheel-case.

Wheels constructed and mounted as above described are not broadly new; and the novel feature of my invention consists in mounting the wheels horizontally to operate in a channel between two hulls having straight and parallel sides, the said wheels being provided with hubs which extend beyond the wheel-case and project into the channel-way. The channel thus forms a protection to the exposed parts of the wheel, and its straight and parallel sides prevent the formation of a wave of progression, while the protrusion of the hubs into the channel-way secures this important result—*i. e.*, the narrowing of the channel-way at this point—so that the rapid displacement of the water to the rear from the revolution of the wheels is compensated for by the increased volume of water in the channel in front of the wheels, thus preventing the wheels from revolving in dead-water, or a partial vacuum formed by the lowering of the level of the water, and discharging it to the rear faster than it can flow to the wheel, which would take place if the space in

the channel between the wheels were as great as it is in front of the wheels.

Figure 1 is a view of the under side of a vessel provided with my improved submerged paddle-wheel. Fig. 2 is a side view of the vessel. Fig. 3 is a vertical cross sectional view of the same, and Fig. 4 is a plan view of one of the upper collars of the hub.

A A' are the lower portions of the hull, separated to form an open channel between them.

B is the open channel with two straight and parallel sides and an open bottom. The top of the channel is closed or covered above the water-line.

C C are the hubs of the wheels, seen partly to project out from the edge of the open side of the casings or from the recesses in the hull of the vessel. The projecting portion of the hub is closed or solid on the top, bottom, and its peripheral face R. The hub is constructed with an inner box, *c*, which carries two collars, *d* and *e*, the collar *d* being formed with an annular flange, *f*, which projects inward beneath the lower end of the cylindrical box, and is formed with a female thread adapted to engage with the lower threaded end of the paddle-wheel shaft H, while the upper collar, *e*, is formed with an outwardly-extending flange, *h*, which is provided with a number of apertures, *i i*, as best shown in Fig. 4. The purpose of these apertures will presently be explained.

The buckets or floats *m m* are, as usual, carried by radiating arms *l l*.

Each of the wheels is rotated by a vertical shaft, (shown at H H,) the lower ends of said shafts being guided and held by steps *n n*, which are fixed to the hull-frames without projecting up into the recesses formed by the wheel-cases, and so that when the wheels are mounted in position the peripheries of their hubs will project out from the wheel-casings. This projection should as nearly as practicable bear the same relation to the projection of the floats from the hubs as does the slip of the wheels to the speed of the vessel. The shafts H H carry bevel gear-wheels *o o*, which are engaged by other bevel gear-wheels *p p*, carried by the power-shaft P, which is connected with the machinery furnishing the propelling-power of the vessel.

In placing the paddle-wheels in position they are minus their shafts H H, and movable

collars *t t* thereon introduced through openings in the outer side of the hulls and pushed inward until the boxes *c* are directly over the steps *n n*, when the shafts *H H* are introduced through a central opening in the top of the casing and given a few turns in order that the screw-thread *s*, formed near the lower ends, may engage with the female thread of the flange *f*. As soon as the lower ends of the shafts strike upon the steps *n n* any continuation of their rotation will act to elevate the wheels and raise them from contact with the bottom of the recesses *a a*, it being of course understood that at this time the wheels must be held and kept from turning. Each of the wheel-shafts *H H* carries a collar, *t*, on which is fixed a downwardly-projecting pin, *u*, which, when the wheels have been raised to the required position, is lowered to engage with one of the apertures *i i* of the flange *e*, and the collar *t* is then keyed to the shaft, as shown.

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

1. The combination, with a vessel formed with two hulls and a central water-way, of a pair of horizontal paddle-wheels formed with hubs that extend beyond the wheel-case and within the central water-way, substantially as described.

2. The combination, with a vessel, of a horizontal paddle-wheel the hub of which is provided with a threaded flange, *d*, and a flange, *e*, formed with apertures *i i*, a power-shaft, *H*, formed with a thread, *s*, and a collar, *p*, formed with pins *u u*, arranged to be keyed to the power-shaft, substantially as described.

RICHARD KIRSCH.

Witnesses:

EDWARD KENT, Jr.,

C. SEDGWICK.