

(No Model.)

J. S. BAKER.
PADDLE WHEEL BOAT.

No. 482,115.

Patented Sept. 6, 1892.

Fig. 1.

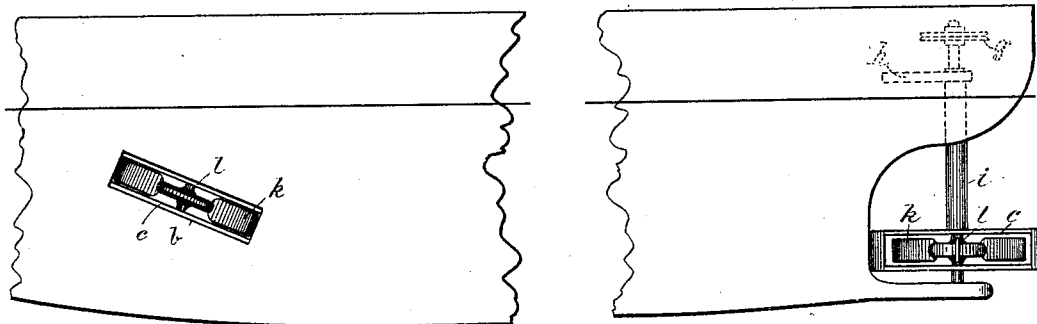


Fig. 2.

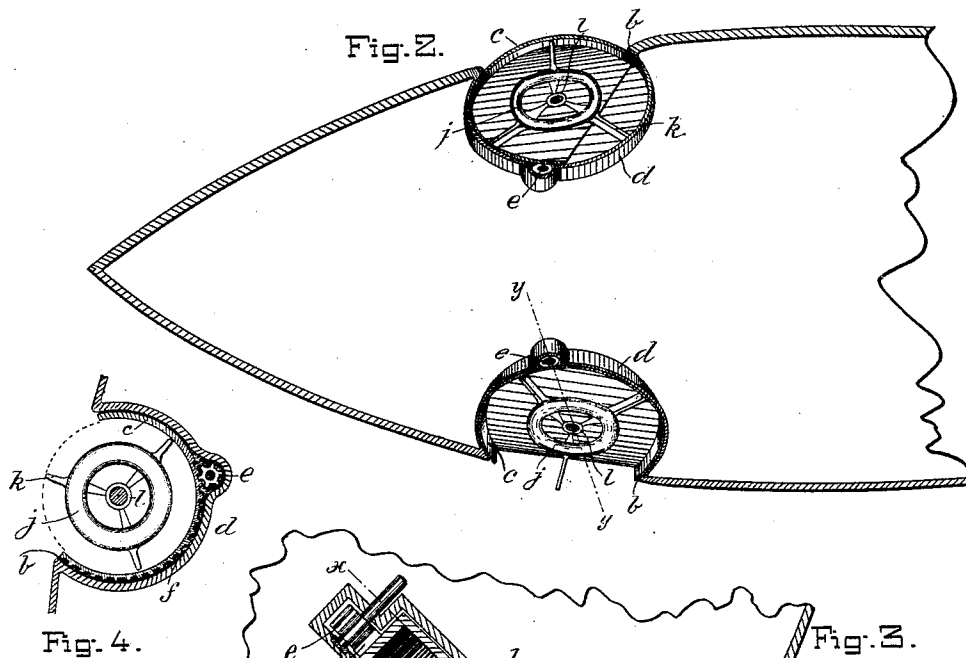


Fig. 4.

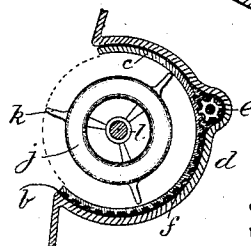
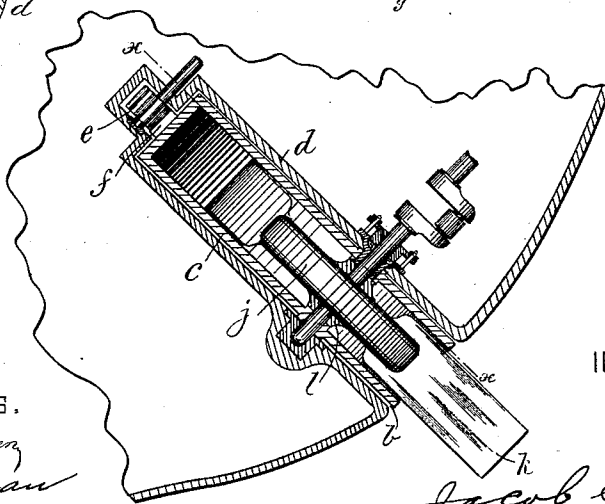


Fig. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JACOB S. BAKER, OF NEW YORK, N. Y.

PADDLE-WHEEL BOAT.

SPECIFICATION forming part of Letters Patent No. 482,115, dated September 6, 1892.

Application filed October 26, 1889. Renewed February 4, 1892. Serial No. 420,252. (No model.)

To all whom it may concern:

Be it known that I, JACOB S. BAKER, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented new and useful Improvements in Paddle-Wheel Boats, of which the following is a specification.

My invention relates to paddle-wheels arranged in recesses of the hull below the water-level, with the paddles projecting from the recesses into the water for taking effect thereon to propel the boat; and it consists of said wheels located forward of the middle and where the shape of the hull has parting action on the water and the wheels have buoyant effect on the bow. It also consists of the angular arrangements of the same, and it also consists of certain arrangements of the wheels relatively to the opening in the sides of the hull, out of which they project, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 represents parts of a hull in side elevation and shows the angular position of the wheel relatively to the fore-and-aft direction of the hull which I propose for such wheels when located in the sides of the vessel, and it also shows the arrangement of such a wheel in the stern both for propelling and steering. Fig. 2 is a longitudinally-horizontal and transversely-inclined section partly on line *x x*, Fig. 3, which represents one side, and partly on the reverse line of the other side, showing the transverse angularity of the wheels which I propose. Fig. 3 is a vertical transverse section of part of one side of the hull, as on line *y y*, Fig. 2, also showing the transverse angularity of the wheels and being on an enlarged scale. Fig. 4 is a horizontal section of a wheel case and cover or hood, showing the preferred form of wheel and relative arrangement of the wheel and recess.

In Fig. 1 I represent the wheels as located in the recess *b* in the side of the hull forward of the middle thereof and as inclined relatively to the lengthwise direction of the hull from the front downward astern, so that by reason of such inclination the wheel has a powerful lifting effect on the bow, besides the forwardly-propelling action, and I consider that the propelling action is no less with the wheels so inclined than if placed in the lon-

gitudinal plane, so that whatever is gained by the lift of the bow makes the vessels practically so much lighter, and therefore more speedy. The wheels also have powerful lifting effect on the bow, and also superior propelling effect by reason of being located in the forward part, where the shape of the hull has parting action on the water by reason of the greater resistance which the water gives in being thrust aside by the inclined sides of the boat.

In Figs. 2 and 3 I represent the transverse inclinations of the wheels of this kind when placed in the sides of the bow, either with or without the longitudinal inclination, whereby the projecting paddles are brought deeper into the water, which is thereby more resistant, and besides the projecting paddles are brought so far down the curved sides that the overhanging of the sides above serves as a guard to protect the paddles from interference with the dock or pier sides when the ship is in dock and the transverse plane of the opening of the wheel-recess is about at right angles to the side of the vessel. For utilizing such wheels to steer the vessel, also, I arrange a cover or hood *c* within the inclosing case *d* of the wheel-recess and inclosing it to the same extent as said case, but capable of turning on the axis of the wheel, so that by turning said cover or hood, as by the pinion *e*, gearing with the toothed rack *f* on the back of the cover, whereby the open part through which the paddles project to propel the boat is shifted around, or partly so, and the closed part similarly brought around the projecting paddles of one wheel, while the other continues to take full effect for propelling, the course of the boat will be correspondingly changed.

The shaft of the pinion (here represented as the means of shifting the steering-cover) will be suitably connected with the pilot-wheel for being operated as required. Any other approved means of gearing the cover with the pilot-wheel may be employed. A similar wheel *a*, located at the stern and provided with a similar cover or head *c*, will propel the boat forward or backward, according to which way the wheel revolves, with said cover adjusted with its opening to one side, as represented in Fig. 1, and the cover being duly

turned forward or backward will control the course of the ship, and by turning the cover half-round without reversing the wheel the motion of the ship will be reversed. In this case it is better to locate the wheel outside of the hull entirely instead of locating it in the recess, because it is desirable that the paddles shall project directly sidewise from either side of the longitudinal center of the ship for driving forward at one side and backward at the other side. Still the wheel may be recessed in the "dead-wood" to some extent.

In the stern-wheel arrangement I represent the pulley *g* (dotted) as the means of driving the wheel by a belt, and the tiller *h*, also dotted, as connected with the sleeve *i*, connected to and by which the cover *c* is turned, the wheel-shaft extending through the sleeve.

In constructing the wheel I prefer to make a strong ring *j* intermediate to the paddles *k* and the hub *l* and either about as large radially as the distance of the shaft from the surface line of the hull across the opening of the recess in which the wheel is placed, as represented in Fig. 3, or preferably somewhat larger, as represented in Fig. 4, said ring being suitably connected to the spokes of the hub, and the paddles attached to or formed with the ring at their inner ends, said ring being the same width on the face as the width of the paddles and as the vertical height of the recesses. This makes a strong construction, and the ring makes less displacement of the water within the case than if the blades had direct extension to and connection with the hub.

In the upper side of Fig. 2 I represent the cover shifted so as to inclose the projecting part of the wheel and cut off its propelling action, as when the course of the ship is to be changed to starboard, the port-wheel being in full action. For high speed I prefer to make said ring in the larger proportions represented in Fig. 4 to bring the pitch-line or line of mean circumference of the effective portions of the paddles near the outer ends of the blades and will, if necessary in such case, make the paddles broader for the requisite area. The ring, thus limiting the length of the paddles inwardly, is less obstructive of rotation than the portions of the paddles displaced or cut off by it, because they displace water by forcing it around in the recess and without propelling effect, while the ring has only surface friction on the water.

I have found by practical experiments with this kind of paddle-wheels that three paddles give the best effects, and I propose to so construct the wheels and to make the openings of the recesses one-third of the circumference, so that as one paddle emerges the one ahead retires and only one is operative at once.

I claim as my invention—

1. The combination, with the hull of a vessel, of paddle-wheels located in and project-

ing laterally from recesses in the sides of the hull forward of the middle thereof, said wheels having their plane of rotation inclined from the front downward lengthwise of the hull.

2. The combination, with the hull of a vessel, of paddle-wheels located in and projecting laterally from recesses in the side of the hull, said wheels having their plane of rotation inclined downwardly outward transversely and being wholly below the water-line.

3. The combination, with the hull of a vessel, of paddle-wheels located in and projecting laterally from recesses in the sides of the hull forward of the middle thereof, said wheels having their plane of rotation inclined from the front downward lengthwise of the hull and also downwardly outward transversely and being wholly below the water-line.

4. The combination, with the hull of the vessel, having the wheel-recesses in the sides below the water-line and adapted for horizontal paddle-wheels, of such wheels located in said recesses and consisting of paddles attached at the inner ends to a ring of equal width on the face as the width of the paddles and equal, or thereabout, to the vertical width of the recesses and attached to arms of the wheel-hub, the radius of said ring being equal to the distance of the wheel-shaft from the mouth of the recess, substantially as described.

5. The combination, with the hull of the vessel, having the wheel-recesses in the sides below the water-line and adapted for horizontal paddle-wheels, of such wheels located in said recesses and consisting of three paddles attached at the inner end to a ring of equal width on the face as the width of the paddles and equal, or thereabout, to the vertical width of the recesses and attached to arms of the wheel-hub, the radius of said ring being equal to the distance of the wheel-shaft from the mouth of the recess, and the opening of the recess being one-third of the circumference of the wheel, substantially as described.

6. The combination, with the hull of the vessel, having the wheel-recesses in the sides below the water-line and adapted for horizontal wheels, of such wheels located in said recesses and each consisting of three paddles attached at the inner end to a ring or hub secured to the shaft and being of equal radius, or thereabout, as the distance of the wheel-shaft from the mouth of the recess and the opening of the recess being one-third of the circumference of the wheel, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 2d day of October, 1889.

JACOB S. BAKER.

Witnesses:

WILFRED B. EARLL,
W. J. MORGAN.