A. Connison

Paddle Wheel.

No. 2,672.

Patented Jun. 18, 1842.

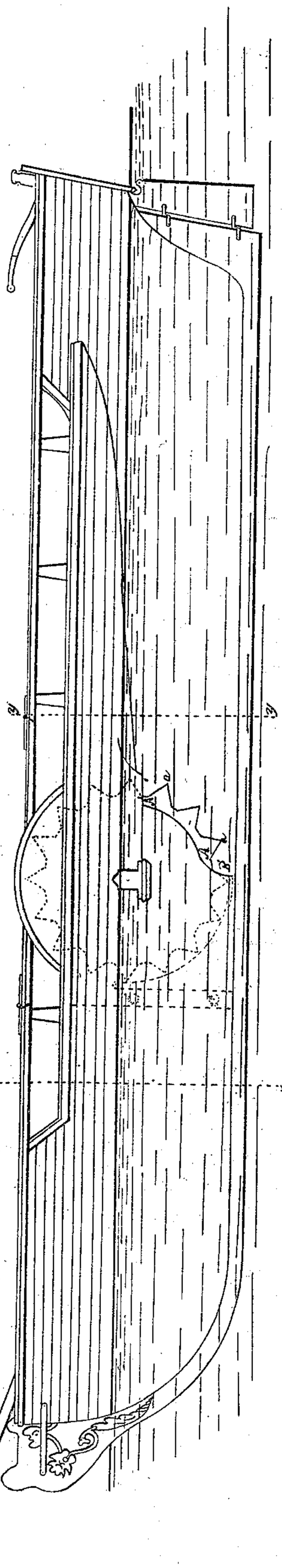

Fig. 1

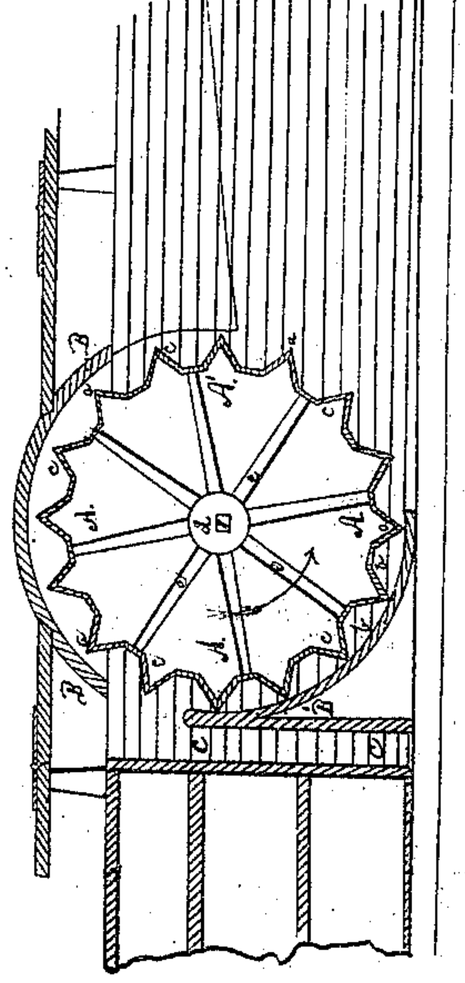

Fig. 2

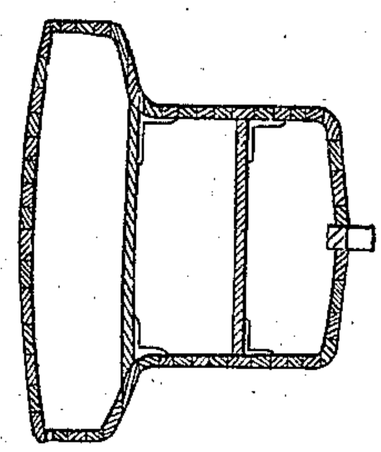

Fig. 4

Fig. 3

UNITED STATES PATENT OFFICE.

ALEXANDER CONNISON, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN THE MANNER OF CONSTRUCTING PADDLE-WHEELS AND OF COMBINING THE SAME WITH STEAM-VESSELS.

Specification forming part of Letters Patent No. **2,672**, dated June 18, 1842.

To all whom it may concern:

Be it known that I, ALEXANDER CONNISON, of the city of Newark, in the county of Essex and State of New Jersey, have invented a new and improved mode of propelling vessels by means of paddle-wheels of a novel construction and combined in a peculiar manner with the vessels to be propelled, which wheels I denominate "Transatlantic Paddle-Wheels;" and I do hereby declare that the following is a full and exact description thereof.

The paddle-wheels which I employ are placed vertically, and are usually made of such diameter as to extend from the top of the taffrail to a level with the bottom of the planking of the vessel, or nearly so. These wheels are particularly adapted to the larger class of vessels intended for sea-service, as they depend for their efficiency upon the altitude of the column of water from their lower sides to the water-line. In a vessel of two thousand tons burden their diameter may be nearly forty feet, and they may be submerged to a depth nearly or quite equal to their semi-diameter. The paddles are not made with their surfaces radiating from the center of the wheel; but the cross-section of each of them would present a triangle, its two faces forming two of the sides, and its base, or the portion by which it is joined to the body of the wheel, its third side. I am of opinion that the best form to be given to these buckets would be that in which such a triangle would be nearly equilateral—that is to say, the planes of each of the paddles should form with each other an angle of sixty degrees. Probably, however, it may be found advantageous to make this angle still more obtuse, so as to approach more nearly to a right angle.

These paddle-wheels are to revolve within suitable shields or cases, which embrace them for about three-fourths of their circumference, leaving about one-fourth of the paddles uncovered, being that fourth which is toward the bottom and stern of the vessel, and which would be contained between vertical and horizontal lines drawn from the center of the wheels downward and toward the stern. Said wheels are to be as nearly as possible in contact with the lower portions of the shields or cases within which they run without their actually touching them.

In the accompanying drawings, Figure 1 is a side view of a vessel furnished with my paddle-wheels. Fig. 2 is a section through the center of one of the wheels in the plane of its sides, and also of the case or shield within which it revolves. Fig. 3 is a cross-section of the vessel in the line *x x* forward of the paddle-wheels, and Fig. 4 a similar section in the line *y y* in the rear of said wheels.

A A A in Fig. 2 is a section of one of the paddle-wheels inclosed in its shield or case, the part A′ A′ being that which is exposed to the action of the water.

B B is the shield or case within which the wheel is to run. The portion B′ B′ of the rim of this case should be nearly in contact with the angular edges *a a* of the paddles, and the sides of the case in this part of it should also be nearly in contact with the sides of the wheels.

The wheels are to revolve in the direction of the arrow with a velocity greater than that which would be acquired by a body falling by its own gravity to a distance equal to the depth of the lower part of the wheel from the surface of the water, as they are by the rapidity of their revolutions to remove the water from and to prevent its entering the spaces *b b* between the respective paddles. The propelling-power under this arrangement is the pressure of the water upon the face of the bucket which is emerging from the case or shield B′ B′, there not being any pressure of water behind such bucket, in consequence of its exhaustion from the spaces *b b* by the action of the wheels, as above described, and this pressure will be continuous and effective so long as the wheel by its velocity preserves the exhaustion of said spaces. The force of this pressure will, it is manifest, be that due to the altitude of the water above the point of action; and it becomes important, therefore, to cause this to be at the lower part of the vessel, or as nearly as may be on a level with the upper part of the keel. From the fact of the great amount of this pressure at great depths the lengths of the buckets or the distance of one side of the wheel from the other will be much less than that required for paddle-wheels as ordi-

narily employed. If, for example, a paddle-wheel of the common construction dips into the water to a depth of two feet and the paddle as used by me is at a depth of sixteen feet below the surface, the latter will be subjected to eight times the pressure of the former and will be equal thereto upon one-eighth part of the surface, and so of any other relative proportions. The wheel, therefore, and the case or shield within which it is contained, may be proportionately diminished in width, effecting a corresponding saving of space in the whole width of the vessel, and thereby lessening the displacement of water in its cross-section. The buckets from their form will have but little tendency to lift the water as they rise from it. From this form also they will be but little liable to be injured by coming into contact with logs, ice, or other obstructions, their tendency being to throw off such matters and move them out of the way.

C C are channels which extend down from the upper point of the part of the case or shield B′ B′, and are intended for the escape of any water which may be raised by the wheel when its motion is reversed, said channels extending the whole width of the wheel.

The periphery *c c* of the wheel, which constitutes the buckets, may be either of cast or of wrought iron, and the shaft to which the wheels are attached is to pass through a hub or nave *d*, having arms *e e* extending from it to the periphery, as shown in the section, Fig. 2. The sides of the wheel are to be formed of wrought-iron plates, left perfectly flat on their outer surfaces and firmly riveted to the rim and to the arms, so as to constitute a water-tight hollow drum. This manner of constructing the wheels will, in conjunction with the exhaustion of the water from the spaces *b b*, give considerable buoyancy to the vessel, and one constructed in this manner will be fitted for carrying a much larger amount of sail than can be admitted with the ordinary propelling-wheels, as there will be no danger of their being lifted out of the water, and if one of the wheels is raised and the other depressed by the heeling of the vessel there will not be any consequent dimunition of propelling-power.

The axle of the wheel may in my arrangement be situated below the water-line, and also below the second deck, as shown at D in the section, Fig. 2. The whole space between decks may therefore be unincumbered by the machinery, as not only the shaft, but the whole of the steam apparatus, may be thus placed below the second deck and also below the water-line. The propelling-power will, when the wheels are thus situated, be more advantageously applied than when the axle, or the point to which the power is applied, is elevated to a considerable height above the water-line. The axles of the wheels will also have little or no bearing upon the lower part of the bosses in which they run, the pressure of the water upon them from the buoyancy of the wheels, and from the whole manner of their action, causing the axles to bear upward and forward.

The sides of the vessel, where the paddle-wheels are situated, are made vertical, and I also prefer to make the sides nearly vertical, and the bottom nearly flat along the greater portion of her run until it becomes necessary to depart from this in forming the stem and stern. By this manner of forming the sides and bottom ample room is obtained for the machinery and for stowage, and the whole structure is adapted to the manner of propelling, and is made to possess the essential properties of such a vessel.

Fig. 3 is a cross-section of the vessel in the line *x x*, and Fig. 4 a similar section in the line *y y* of Fig. 1, these sections showing the form which I think best adapted to the intended purpose. I do not intend, however, to limit myself to this particular shape, as this does not constitute any part of my invention, and may be varied according to the fancy or the judgment of the constructor.

Having thus fully described the nature of my invention and shown the manner in which the same is carried into operation, what I claim therein as new, and desire to secure by Letters Patent, is—

The manner herein set forth of forming the paddle-wheels of vessels to be propelled by steam, and of combining said wheels with such vessels, so as to cause them to be operated upon by the pressure of the superincumbent water upon the principle herein fully made known—that is to say, the construction and use of propelling-wheels, which are to be contained within a case or shield of the kind herein described, and which are furnished with paddles the faces of which form an angle with the radii of the wheel and which are so combined with the shield or case which partially surrounds the wheel as to exhaust the water from a part thereof corresponding with that marked B′ B′ in the accompanying drawings, and by which the pressure of the superincumbent water is made to act upon the paddles as they emerge from said case or shield, and thereby to force the vessel forward with a power proportioned to said pressure, the whole construction and manner of operation being substantially the same with those herein fully made known.

ALEXANDER CONNISON.

Witnesses:

THOS. P. JONES,

CHAS. G. PAGE.