(No Model.) 2 Sheets—Sheet 1.

N. T. EDSON.

VERTICAL FLOAT PADDLE.

No. 453,180. Patented June 2, 1891.

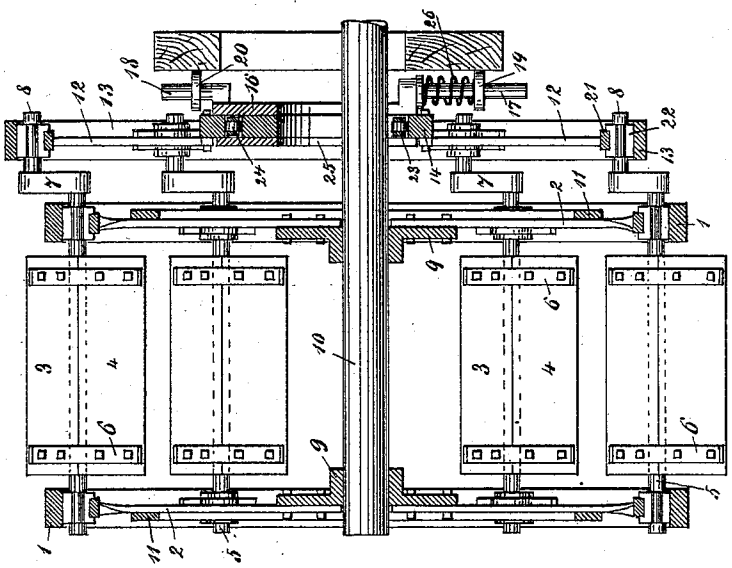


Fig. I.

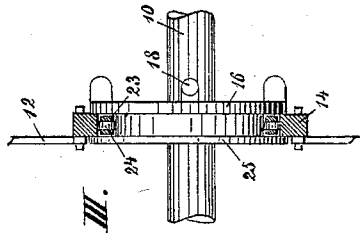


Fig. III.

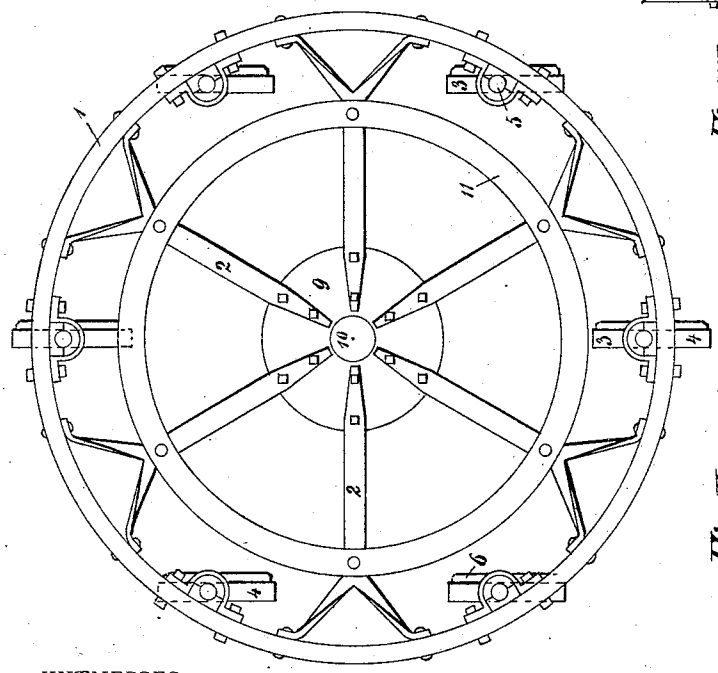


Fig. II.

WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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VERTICAL FLOAT PADDLE.

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Fig. IV.

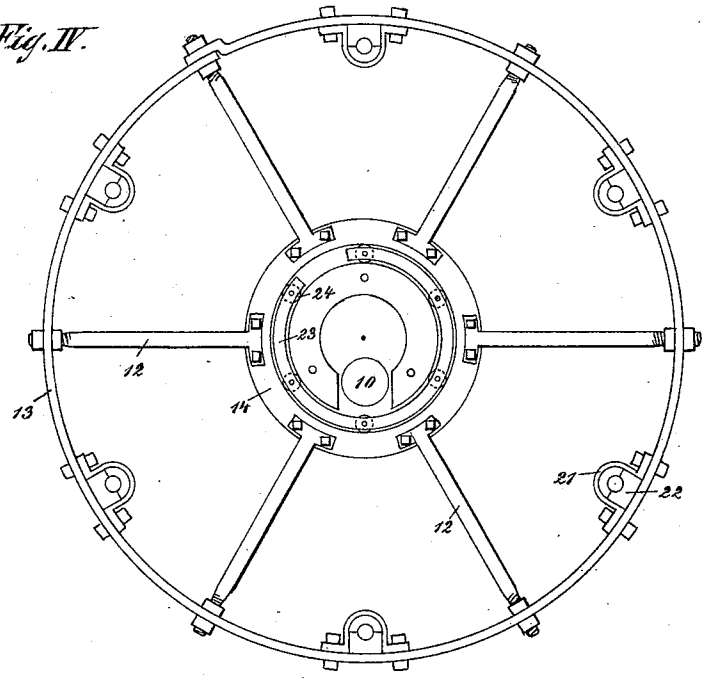


Fig. V.

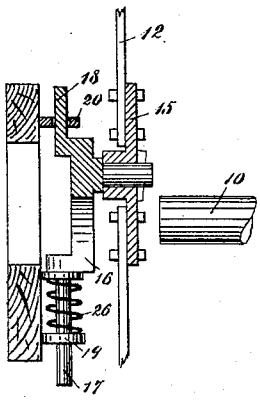
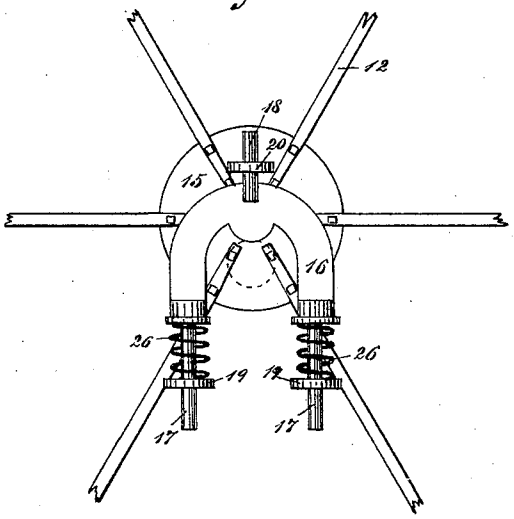


Fig. VI.



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UNITED STATES PATENT OFFICE.

NATHANIEL T. EDSON, OF NEW ORLEANS, LOUISIANA.

VERTICAL FLOAT-PADDLE.

SPECIFICATION forming part of Letters Patent No. 453,180, dated June 2, 1891.

Application filed July 11, 1890. Serial No. 358,421. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL T. EDSON, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Vertical Float-Paddle Wheel, of which the following is a specification.

My invention relates to those paddle-wheels in which the inclination of the float to the radius of the wheel is varied during revolution, in which, in order to regulate and determine the direction of entrance and exit of the float from the water, an eccentric is employed for actuating them upon their axes.

The object of my invention is to so construct and support the eccentric mechanism that in its performance the fluctuations in the positions of the guard (relative to the paddle-wheel) from straining the eccentric mechanism or controlling-wheel, its connections, and the paddle-wheel, caused by the float-cranks on passing their dead-centers or otherwise, will be avoided; also, to provide means whereby a vessel may be run advantageously when heavily laden and in a rough sea, to obviate vibratory motion on the floats entering the water and adapted to hold the floats in a vertical position automatically, and to increase the speed and propelling power of the vessel.

The first part of my invention consists of the combination of the controlling-wheel for operating the floats, with a yielding bearing on which it rests and revolves.

My invention consists, further, of the combination of the controlling-wheel arranged eccentrically to the wheel proper with the float, the bottom portion of which is wider than the top portion.

My invention consists, further, in forming the wheel with bifurcated wheel-arms to brace the wheel.

My invention consists, further, of the combination of the controlling-wheel with rollers and segments for avoiding friction.

My invention consists, further, in the manner of forming the controlling-wheel whereby a yielding bearing is produced to relieve the mechanism of strain.

My invention consists, further, in a mechanism arranged eccentrically to the main shaft to impart a rocking motion to the float by which some of the power lost, as in the radical wheel, is saved, in combination with the float, the outer portion of which is wider than the inner portion, for feathering the float.

I will proceed to describe my improved wheel, referring to the accompanying drawings and to the numerals of reference marked thereon.

In the said drawings, Figure I is a front vertical sectional view of the wheel complete; Fig. II, a side elevation of the wheel, with the controlling-wheel removed; Fig. III, a top sectional view of a mechanism on which the controlling-wheel revolves; Fig. IV, a side elevation of the controlling-wheel; Fig. V, a front sectional view of a modification of Fig. III, adapted to be applied in case the main shaft has no outside bearing; Fig. VI, a side sectional view of Fig. V.

Similar numerals refer to similar parts throughout the several views.

1 are rings of the wheel, to which the floats are pivotally attached. The wheel in the present instance has twelve wheel-arms 2 and six floats, each of which floats is composed of boards 3 and 4, (preferably of wood,) shaft 5, board stay-irons 6, keyed to shaft 5, and crank 7, with its pin 8, by which crank and pin the floats are connected with the controlling-wheel.

The outer rings 1 of the wheel are formed by bending the metal flatwise. Wheel-arms 2 are attached to the hubs 9, which hubs are keyed to main shaft 10. Arms 2 are bifurcated at their outer ends. Ring 11 is secured to arms 2 at the point of bifurcation. The controlling-wheel, which determines the position of the floats, is composed of arms 12, which are rounded at their outer ends, where they are connected with ring 13, which ring is formed of spring metal. Their inner ends are connected to ring-hub 14. The ring-hub is constructed to turn upon a journal, Fig. III, located eccentrically to the main shaft 10. Arms 12 are threaded at their outer ends and nuts screwed on them both inside and outside of ring 13. The controlling-wheel, of the same diameter as the wheel proper, is placed at its side at an elevation of the length of crank 7 above it. Ring-hub 14 revolves on form 16, which form is provided with arms

17, on which arms springs 26 are placed, the springs resting on sockets 19, through which sockets the ends of arms 17 pass. The sockets are attached to the side of the vessel or guard timber. The guide-arm 18 of form 16 enters socket 20, which is also secured to the side of the vessel or guard timber. 25 is a circular plate by which the controlling-wheel is held on its journal. There is a space between the ring-hub 14 and form 16, in which space rollers 24 revolve. The rollers are pierced with orifices through their centers, through which orifices pins are placed and secured to segments 23, by which the rollers are held parallel. The object of the above-described mechanism is to reduce friction and permit the controlling-wheel to accommodate itself to the movement of the paddle-wheel and its shaft under strains caused by crank 7 on passing their centers and otherwise. The object of the above manner of forming the controlling-wheel is to effect a similar result. I have ascertained by experiments that the friction of the float-shaft 5 journals is about thirty-eight per cent. of the pressure upon them, whether wet or dry; that it requires that much if applied at the circumference of the journal to overcome its friction; that a float twenty-four inches wide requires about ten per cent. of its width to be added to its bottom portion to overcome the above friction when under pressure. A float forty-eight inches wide requires about four per cent. of its width to be added to its bottom portion. In other words, a float that is two feet wide requires about two and a half inches to be added as above; if three or four feet wide, about two inches to produce the above result. I therefore add to the bottom portion of floats of all widths in a corresponding ratio to the above and add one-half inch more to counteract the friction of the float-shaft and crank-pin journals when out of the water.

One part of my invention is applicable to wheels that have been in extensive use for many years, known as the "Clyde" or "feathering" wheel, in which the floats are hung upon a center and are so governed by a mechanism that the entering and emerging floats have a direction intermediate between a radius and vertical line. In such wheels ring 13 is not used, and only one of the arms 12 is rigidly attached to hub 15, the others pivotally thereto. Crank 7 is substituted by arms extending from the floats, which arms connect by pivot to the outer ends of arms 12. The journal of hub 15 in this case is rigidly attached to the guard-timber. To such wheels I add two inches to the outer portion of each float by which a perceptible increase of speed and diminution of wear of the operative parts of the mechanism is effected. For sea-going vessels I prefer wheels of large diameter, with about one float to every four feet of diameter of wheel, with the floats of a size that will admit of about forty per cent. slip of wheel, so that the entering and emerging floats will not carry a mass of water before them when the wheel is deeply immersed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a vertical float-paddle wheel, of a controlling-wheel of the float arranged eccentrically to the axis of the wheel proper for operating the float, and a yielding bearing for the controlling-wheel, consisting of the form 16, with its arms 17, sockets 20, and guide-arm 22, with its socket 23, and the spring 26 below and supporting the form, substantially as described.

2. In a vertical float-paddle wheel, the combination of a float composed of boards 3 and 4, shaft 5, and crank 7, the lower portion of which float is wider than the upper portion, with a controlling-wheel of the float arranged eccentrically to the axis of the wheel proper for operating the float, the outer ring of which controlling-wheel is formed of spring metal to provide a yielding bearing for the float-crank wrist, substantially as described.

3. The combination, in a vertical float-paddle wheel, of the shaft-arms secured thereto, the outer end of each of which is bifurcated or made of two parts to brace the wheel, a ring secured thereto upon which the floats are suspended, and an inner ring secured to the arms at the point of bifurcation, substantially as described.

4. In a vertical float-paddle-wheel hub 14, to which the controlling-wheel is attached, in combination with rollers 24, one edge of which rollers bear against the inner edge of hub 14 and the other edge against form 16, and held parallel with each other by their connection with segments 23, substantially as described.

5. In a feathering float-paddle wheel, the combination of a mechanism arranged eccentrically to the main shaft for actuating the floats upon their axes, which mechanism is composed of a series of arms pivotally attached to a central hub, one of which arms is rigidly attached to the hub, the outer ends of all of which arms are pivotally attached to the ends of arms extending from floats, with floats the outer portions of which are wider than the inner portions to assist the mechanism to hold the floats in a feathering position, all substantially as described.

NATHANIEL T. EDSON.

Witnesses:
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GEO. C. PIEOT.