No. 745,745. PATENTED DEC. 1, 1903.

L. VOJÁCEK.

PADDLE WHEEL.

APPLICATION FILED JAN. 13, 1902.

NO MODEL.

Fig. 1.

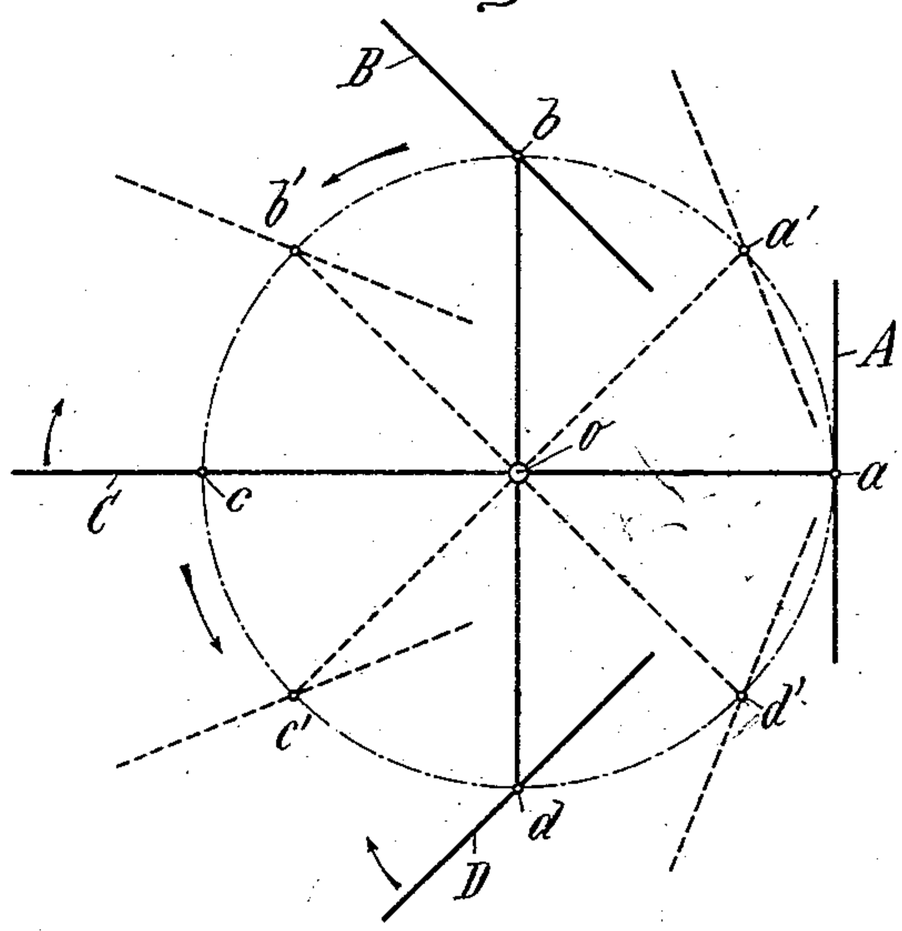

Fig. 2.

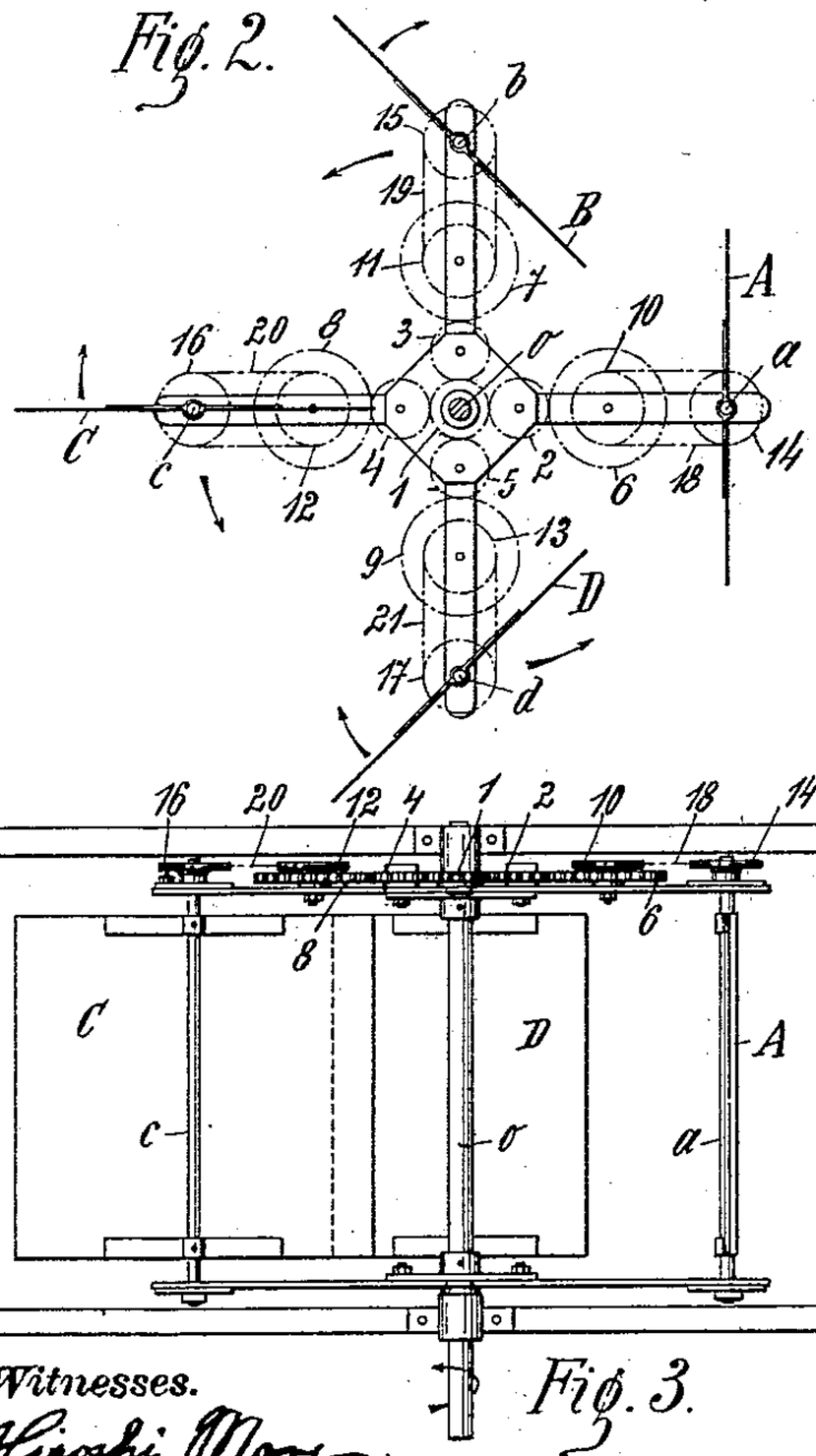

Fig. 3.

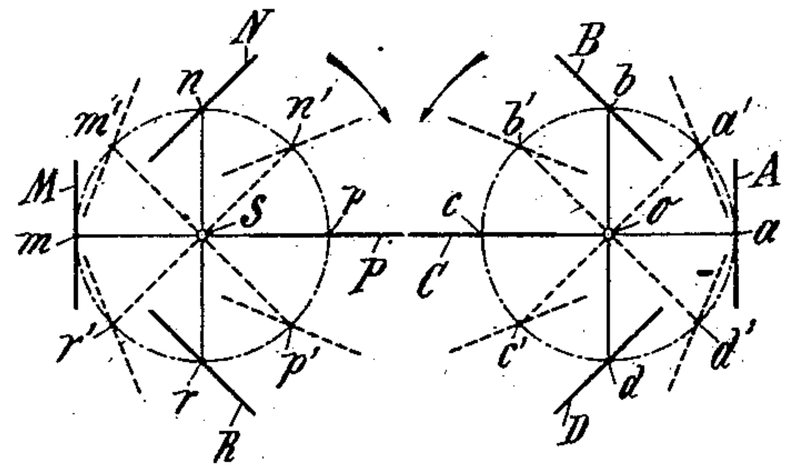

Fig. 4.

Witnesses.
Higashi Mori
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Att'y

No. 745,745. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

LADISLAV VOJÁCEK, OF PRAGUE, AUSTRIA-HUNGARY.

PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 745,745, dated December 1, 1903.

Application filed January 13, 1902. Serial No. 89,591. (No model.)

To all whom it may concern:

Be it known that I, LADISLAV VOJÁCEK, a subject of the Emperor of Austria-Hungary, residing in Prague, in the Kingdom of Bohemia, Austria-Hungary, have invented a new and useful Paddle-Wheel, of which the following is a specification.

My invention relates to improvements in propelling paddle-wheels which by the rotation of flat paddles on their own axis in combination with their own rotation around a central axis in the air, water, or in any fluid medium in which they are fully immersed cause a reaction for the purpose of propelling either said medium through the propeller itself or said propeller with its vessel through said medium. I attain these objects by the mechanism illustrated by the accompanying drawings, in which—

Figure 1 is a diagram showing the principle of the wheel. Fig. 2 is a side elevation, and Fig. 3 a plan view, of the wheel. Fig. 4 shows a couple of equal wheels, which are disposed symmetrically to each other and revolve in opposite directions with the same effect as in Fig. 2.

Similar characters refer to similar parts throughout the several figures.

The propeller is a paddle-wheel which consists of a number of flat and equal paddles or wings A B C, which turn around their arbors *a b c* in one and the same direction, said arbors being disposed at equal distances from the central shaft of the wheel, Fig. 1. These arbors of the paddles rotate around the said central shaft in the opposite direction thereto and an annular velocity which is double the annular velocity with which the paddles or wings rotate round their own axes. The diagram Fig. 1 illustrates said principle.

There are four flat and rectangular paddles A B C D of equal size disposed upon and between two sets of arms or disks with their parallel arbors *a b c d* in equal distances from each other and from the central shaft *o*. It will be understood that the number of paddles or wings may be greater or less.

The whole system rotates round the central axis *o* in the direction opposite to that of the hand of a clock, as indicated by the arrows next to the circle *a b c d*. Each of the four paddles or wings rotates round its own axis in the contrary direction—that is, in the direction of the hands of the clock, as indicated by the arrows next, and perpendicular to the paddles or wings. The annular velocity of the rotation round these arbors is only half of the annular velocity of the rotation of these arbors round the central shaft *o*. Therefore if the paddle or wing A is perpendicular to the radius *ao* it will after this radius has turned through a quarter of one revolution, at *b*, be inclined to said radius at an angle of forty-five degrees, as is B, with relation to the radius *ob* in Fig. 1, and arriving at *c*—that is, after the arbor *a* has turned half the revolution round the central shaft *o*—the paddle or wing A has turned in the meantime only one-quarter of a revolution round *a* in the opposite direction, and it has the position indicated by C in Fig. 1, and so on till at last after having made one entire revolution round the axis *o* the paddle or wing A will arrive again at *a;* but it will have turned one hundred and eighty degrees round *a*, its different positions during this revolution being exactly indicated by the corresponding lines at eight points. After two complete revolutions each wing or paddle will occupy exactly the same position as before.

If the wheel has, for example, four paddles or wings A B C D, Fig. 1 shows their relative positions in full lines when their supporting-arms are vertical or horizontal and in dotted lines when this system has turned forty-five degrees.

It will be easily recognized by a glance at the diagram that the prolongations of the straight lines, which in Fig. 1 indicate the different paddles or wings and their different positions, will all meet in one and the same point in Fig. 1 in *a*.

This wheel can be used for propelling vessels if fully immersed in water or air or for propelling blowers and the like.

For a flying-machine the arrangement shown in Fig. 2 may be preferable. It imparts more stability to the vessel, the two vertical downward reactions being more distant from each other. If, therefore, the air vessel has such a pair of wheels on each side, the effect will be exactly as if this vessel would be supported by four strings or chains,

of which the strains are equal to the vertical reactions of the four wheels, and it will be more steady the farther from each other these four reactions will be.

The rotary movement which is required for said wheels can be produced in a great many known ways. In Fig. 2 a central toothed wheel 1 is fixed to the frame, and a wheel 2, of the same size, mounted on an arm *oa*, gears therewith and also with the toothed wheel 6 if the axes of the wheels 2 and 6 rotate with the same arm *oa*, the wheel 6 having twice as many teeth as the wheel 2 or as the wheel 1. It is evident that the wheel 6 will rotate round its own axis with only half the annular velocity that the arm *oa* turns around its own axis *o*, and besides this it will turn in the opposite direction. If the paddle A is fixed upon the arbor of the wheel 6 or upon a parallel arbor *a*, the same which in Fig. 2 is supported upon an arm *oa* at a distance from the arbor of wheel 6, to which is fixed a chain-wheel 10, a like wheel being fixed also upon the arbor *a* and connected with chain-wheel 10 by a chain 18 or the like, it is obvious that paddle A will turn with half the velocity of the whole system round its axis *a* and in the opposite direction.

I am aware that prior to my invention wheels have been made with flat paddles which rotate round their own axis, which are parallel to the axis of the wheel, which rotates around said axis and carries with it the arbors of the paddles. I therefore do not claim such a combination, broadly; but

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

In a propelling paddle-wheel, the combination of a frame, a main shaft mounted in said frame, arms secured to said main shaft, auxiliary paddle-shafts, having their bearings in said arms, paddles on said shafts, a gear-wheel concentric with the main shaft secured to said frame, gears on said arms meshing with said gear, a second set of gears also mounted on said arms meshing with the second-named gears, sprocket-wheels concentric with the last-named gears and turned thereby, sprocket-wheels on the paddle-shafts and chains over said sprocket-wheels, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LADISLAV VOJÁCEK.

Witnesses:
ADOLPH FISCHER,
ARTHUR SCHWEZ.