(12) **United States Patent**
Bulkley

(10) **Patent No.: X3355**
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(54) **WATER WHEEL, OBLIQUE**

(76) Inventor: **Ralph Bulkley**

Ralph Bulkley
Letters Patent dated 7th August 1821

The Schedule referred to in these Letters Patent, and making part of the same containing a description in the words of the said Ralph Bulkley himself of his improvement, being an "Elliptic water wheel."

To all persons to whom these presents shall come, I Ralph Bulkley of the city of New York in the county and State of New York, send greeting:

Be it known that I the said Ralph Bulkley, have invented, constructed, made, and applied to use a new and useful improvement, being an elliptic water wheel or machine to be used for the purpose of propelling vessels, boats or rafts of any description, or other vessels or boats of any description, whether the same are moved by steam or other power, either upon the ocean, lakes, bays, harbours, inlets, creeks or canals: also to be used in a stationary position in order to produce by their operation, or otherwise, power in rivers, creeks, canals, or streams of any description either where there is a fall or flow of water, and, for the purpose of moving mills of all descriptions or manufactories of all descriptions; or for the purpose of forcing or pumping water from rivers, harbours, creeks, canals, or other places for the purpose of filling reservoirs &c. for any other use that may be required. The said improvement is called the "elliptic water wheel," and may be specified in the words following, to wit, four or more semicircles are placed upon the respective sides of an axle or shaft, in a

diagonal or oblique position to the direction of the shaft, and all inclining in the same direction, making an angle with the shaft or axle of forty five degrees, or a greater or less angle as may be found convenient, the paddles being placed upon the shaft in a position similar to the position of the sails of a windmill; but varying in obliquity as convenience may require. And the wheel may consist of a shaft or axle and one or more sets of paddles placed upon it, at a short distance from each other, models of which are deposited in the Patent Office; and one of the forms or shapes of said wheel may be represented in the following manner.

Let the superficies of a circle be divided into four equal parts by lines drawn through the center; and let each quarter of the circle be bent from its position in an equal degree, keeping the center points together, and making an angle at the circumference of each quarter with the former circumference of forty-five degrees, or such other angle as may be found convenient; and in such a manner that the circumference of the former circle shall run through the center or middle point of the circumference of each quarter of the circle so bent from its former position.

If the wheel is to be applied for the purpose of propelling steam ships, or other vessels or boats, a single set of paddles is considered sufficient; but if applied horizontally in steam or currents of water for any of the purposes above mentioned, the wheel may consist of one set or more sets of paddles secured at proper distances from each other upon the shaft or axle. And in either case the wheel may be wholly or partially immersed in the water as may be preferred or

found convenient, and the pressure of the water is in a direction oblique to the direction of the shaft or axle, wherein as in its form, as above described, it differs from all other wheels in use for any of the purposes aforesaid.

The wheel above mentioned may be applied to the stern, bottom or sides of a steam battery, steam ship, or other vessel or boat, and may be either wholly or partially immersed in the water. If applied to the stern of a ship, vessel, or boat, a shaft or axle enters through the stern at a suitable distance below the surface of the water to permit the wheel to be either partially or entirely immersed as may be required and upon this shaft or axle the paddles are secured in the manner above described. If one at the sides or bottom of the ship, vessel or boat. The wheel will also be connected with the machinery by means of a shaft or axle entering the vessel or boat, and the motion of the shaft or axle being to carry the oblique action or pressure of the paddles upon the water produces a strong propelling power.

If pressure in a current produced by the tide where the current moves part of the time in one direction, and part of the time in the contrary direction, the wheel will move with equal rapidity and equal force, whether the water strikes against the front or rear; and the wheel may be wholly or partially immersed in the water as the situation in which it is used may require. The angle or oblique direction of the paddles may also be varied, according to the rapidity of the current, or as will best answer the purpose designed by using it, such as forcing or propelling water or moving mills or manufactories, as above mentioned; or for any other purpose where a force or power, thus obtained, may be applied to advantage, and where used for them or other purposes, the axle or shaft of the wheel

will be connected with the machinery to be moved by it.

The shaft of the axle of the wheel, above described, may be made of wood or iron, or other metallic substance, as may be found most suitable in the situation in which the wheel is used, and the paddles or buckets may be made of wood, cast iron, or other substance, and of greater or less thickness and strength according to the situation in which used, and the power intended to be gained by it, and to be secured firmly to the shaft or axle by means of nails or bolts or in various other ways as may be most convenient. That the paddles may be made in the form of a quarter of a circle, or of a square, oblong, triangular, or other shape. And the paddles may be separate, and placed separately upon the shaft or axle, and secured to the shaft, as a hoe is secured to its handle, with the addition of nails or bolts through the shaft; or the paddles may be joined or continued at the centre, and secured together upon the shaft or axle, by means of a hole through the centre of the wheel through which the shaft or axle may be inserted or in such other manner as may be found convenient.

Among the advantages of the wheel or machine above described, the following may be enumerated: that it may work either wholly or partially under water, as may be found convenient; and it is believed that the same force acting upon a wheel constructed as above described, upon the principle of oblique percussion would move a ship or boat faster than if acting upon the wheels in common use are expended; and such a wheel being attached to a steam batteau, or ship of war, and being wholly immersed in the water, would not be exposed to the same accidents from shot to which the wheels in common use are exposed; and being wholly

increased its motion would not be materially impeded by passage a dashing sea: and when used Nationally in harbours, rivers, creeks, canals, or other streams an adequate force may be obtained by means of the oblique surface of the sliders upon the wheels and may be applied to the purposes above mentioned or to other purposes when a force or power thus obtained may be found convenient or useful.

Witnesses
J Bulkley
Daniel Rebol

Russell Bulkley
Inventor

(Specification recorded 20th Jany 1844)

Not thought necessary to make a drawing of

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All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

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