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Van Gorder

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(54) **WATER WHEEL**

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Isaac Van Tordes of Trumbull Co Ohio

Letters Patent.

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Isaac Van Tordes himself of his Improvement in water mill Wheels.

To all to whom these presents shall come. Be it known that I, Isaac Van Tordes of Trumbull County and State of Ohio, have invented a new and useful improvement in the tub water wheels of mills, which improvement consists in the application of water to mill wheels formed as is hereinafter described, for the purpose of creating a rapid steel motion. By force of the percussion gravitation and motion of the water applied. and that the following is a full and exact description of the said invention or improvement, as invented or improved by me. When the head of water to be used is about ten feet, the body of the wheel may be ten feet diameter & eight inches thick made out of a solid piece of green timber the grain of which should be parallel to the axis. This may be sawed about three feet long and eight inches in diameter furnished with a step gudgeon at the base and at the upper end, with a clasper or coupling gudgeon to allow the arbor shaft to be added and to any desired length, or the shaft may be cut in and of the whole length desired. on this the wheel should be hung at or about six inches from its lower end.

In the step gudgeon there should be a concave or socket about one inch deep that would fit on a convex point or end of an upright steel or stake set in a bridge or piece of wood about ten or eight inches square and long enough to be fastened at its ends to the stone or case herein after described.

The aforesaid concave point and socket should be hardened steel, the upright steel, or stake may be of the same material, or of iron. upon the periphery of the wheel fix at regular distances about twenty buckets making these about two and a half inches broad each, and about eleven inches deep each, of bough rolled iron at least one quarter of an inch thick.

These buckets should be curved in their depth the radius of the curve being about eleven inches. The edges of the pieces of iron

that form the buckets they are to be placed against and fixed in the rim or periphery of the wheel must be also curved so as to fit close to said rim. The upper ends of the buckets should be level with the top of the wheel, and the buckets should be so placed that the water may flow or strike against their upper or concave side. They should be secured firmly to the wheel by screws or bolts passed through the upper and lower ends of the pieces of iron forming said buckets near the inner edge of said ends, the said pieces being cut wider at their ends than elsewhere to allow them to be let into saw kerfs cut into the rim of the wheel near the top and bottom thereof. When the buckets are formed their outer edges must be turned or otherwise brought as by filing to a knife

The wheel having been thus made a strong wooden frame is next to be formed and cased so as to be perfectly tight, with plank two inches and a half thick on its top and sides and on its bottom with plank two inches thick crossed or lapped together four times whilst green, firmly nailed or pinned to each other. Through this bottom cut a circular hole or curb sufficiently large to allow the wheel and its buckets to revolve therein freely. This curb may be lined or cased with sheet iron. But before the top of said case is fastened or put on, a platform or guard should be made of green plank doubled or crossed and nailed or pinned together about three inches thick which platform should rest on the upper surface of the bottom of said case in the centre of this of this platform a hole must be cut of circular form of equal diameter on the lower surface as the diameter of the hole in the curb but of greater diameter by two inches on the upper surface in this hole saw kerfs should be cut into which pieces of rolled iron of about an eighth of an inch thick must be let so as to form shutes or guides in number corresponding to the buckets of the wheel, but they are to be placed or inclined in an opposite direction to the inclination of the buckets and so as to form an angle of about 30 degrees below the horizon

lal line. The inner edges of the pieces of iron forming the shrouds are to be let into said Rings cut into a cylindrical curve of green plank doubled and pinned together three inches thick, the diameter of which should be precisely the same as that of the body of the wheel. The said curbs being connected with the platform by said shrouds or pieces of iron and also by three strong iron bolts, and having a hole cut in its middle thro' which the axis or shaft of the wheel may revolve and thus forming a guard to the wheel. The parts herein before described being constructed as aforesaid, and adjusted so that those which are to move may work without any unnecessary friction. The water may be conveyed by a trunk into the side or top of the case above the level of the upper surface of the platform or guard and be let on by drawing, or be shut off by closing a gate that should be placed at the top of the trunk. The revolutions which a wheel will make, if constructed as aforesaid and driven by a head of ten feet of water would exceed two hundred in a minute.

This wheel however may be made to run in other than horizontal directions, it may be placed vertically or at any desirable angle, and it as well as the case may be made of cast iron instead of wood or partly of each and it will run as well when placed near to the top of the head of water as if placed lower, provided a light trunk or case shall be continued from the bottom of the case or flume beneath the surface of the tail or waste water.

This wheel will run as well when in or under the water as out of it and may be protected from the weather by being emerged in it, under a sixteen feet head of water three hundred revolutions of this wheel may be had in a minute.

By varying the diameter of the wheel and its depth and enlarging or contracting the inner ends of the buckets and the breadth and depth and curvatures or angles of the buckets the velocity of the wheel may be increased or diminished and

the water power may be applied as may be most advantageous & conformable to the objects of the persons employing this invention and its revolutions may be varied from one hundred to three hundred to three hundred per minute so as in most cases to obviate the necessity and save the expence of the gearing required to get up speed. And power may be augmented by putting two wheels having opposite issues within the case or flume on the same axis and still more by putting additional cases or flumes with pairs of wheels thereon.

What I claim as my invention or improvement is the construction of a water wheel to run in a curb or cylinder as above described protected by a platform or guard from the weight or pressure of the column of water employed and depending the axis of the wheel from the excessive friction which that weight or pressure would create at or on the pivot of said axis also the manner of applying water at the periphery of a wheel thro' shutes or guides placed in a protecting platform or guard so as to impel a wheel within a curb or cylinder and flume or case per force of the percussion gravitation and reaction of the water applied

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(1508 words)

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