

H. W. Shipley,

Water Wheel.

No. 103513.

Patented May 24, 1870.

fig. 1.

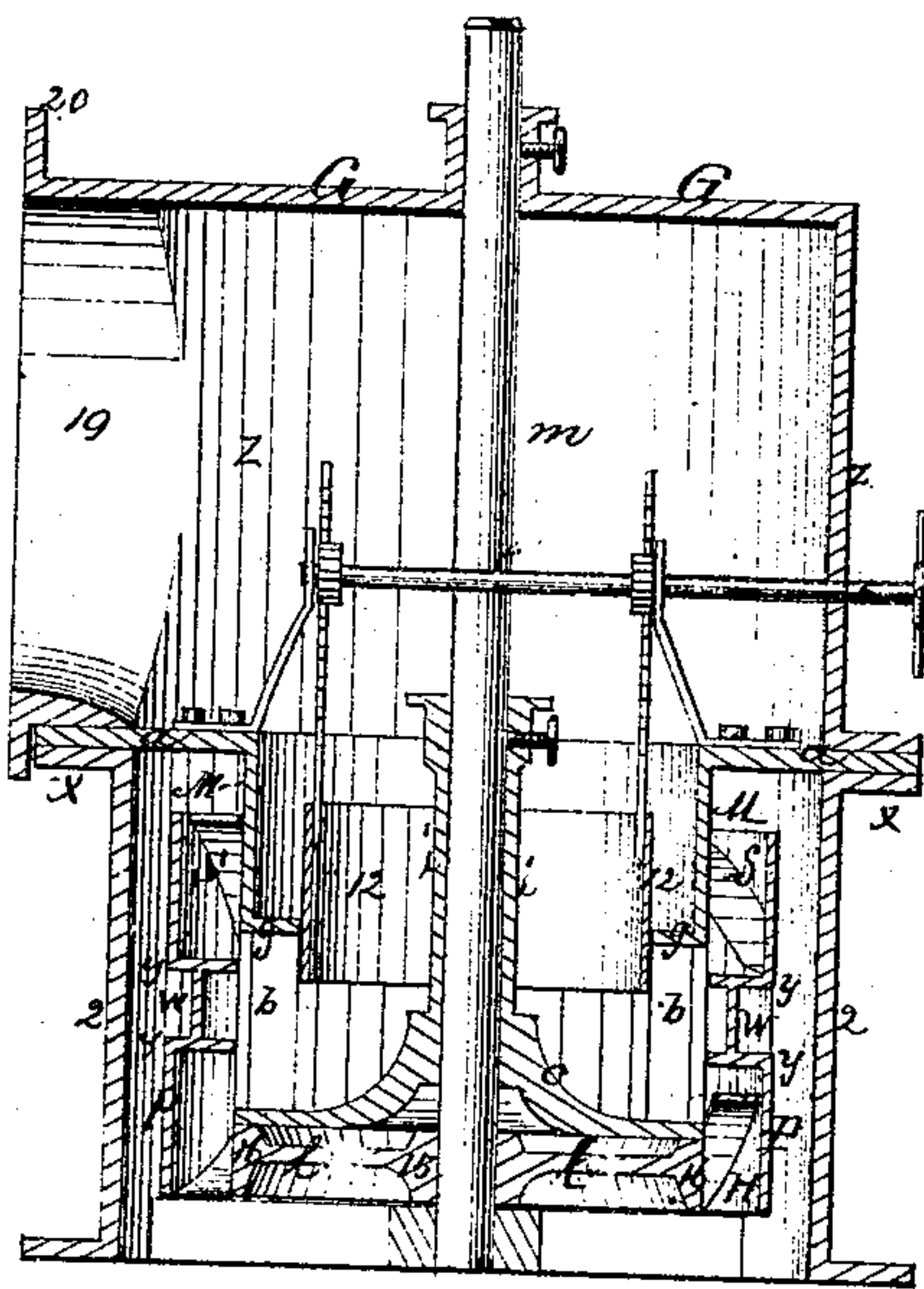
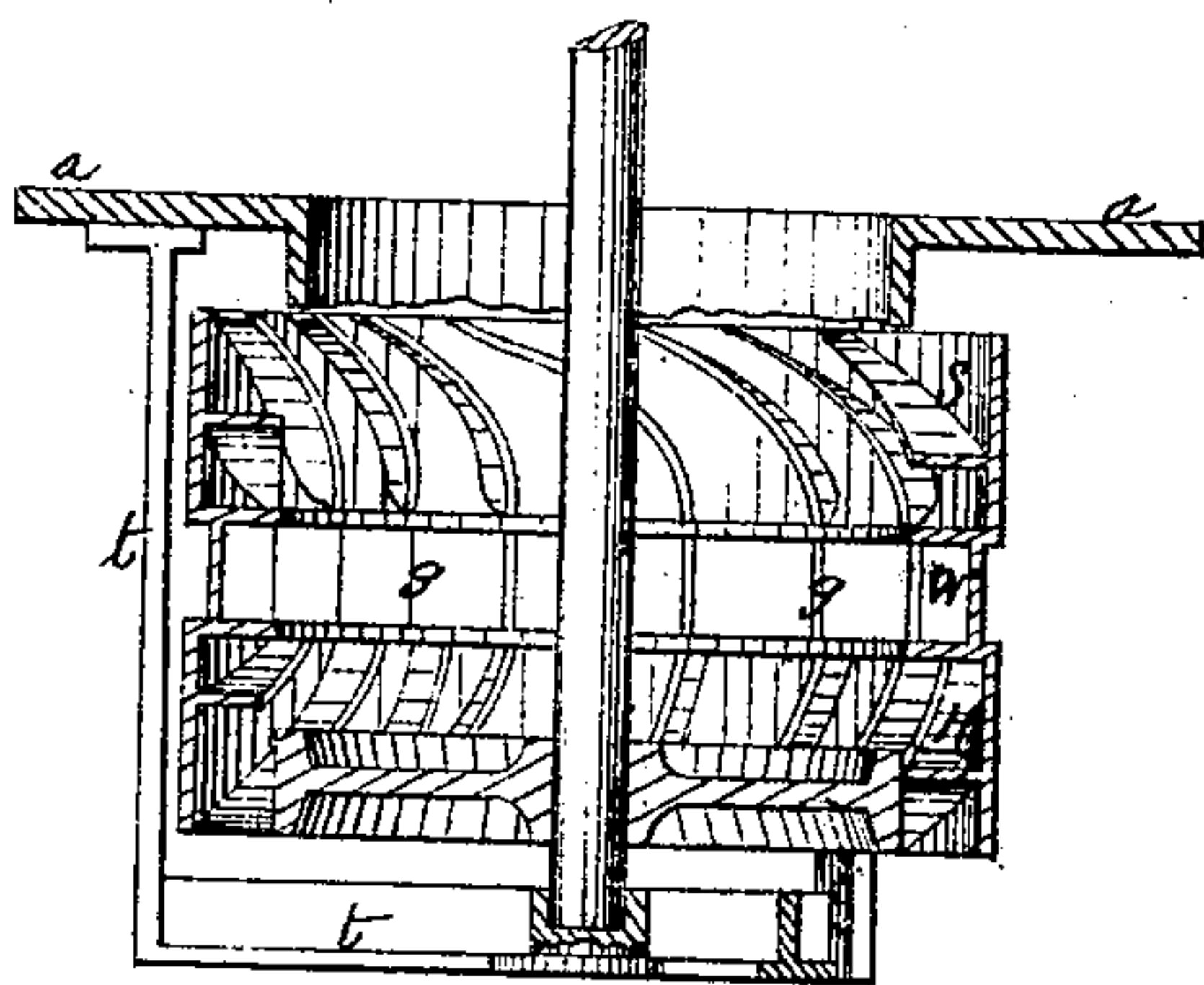


fig. 2.



Witnesses:

Victor Hagmann.
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Inventor:

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United States Patent Office.

HENRY W. SHIPLEY, OF PORTLAND, OREGON.

Letters Patent No. 103,513, dated May 24, 1870.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY W. SHIPLEY, of Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a transverse vertical section of wheel and casing; and

Figure 2 is a similar section, showing the concavity of the wheel, the casing being removed and a tripod support substituted.

This invention relates to constructing a wheel with internal buckets, in such a manner that the water is directed to the outside of the rim, and held as far as possible from the axis during the revolution, so as to obtain its greatest power, the buckets being made exceedingly shallow, and their capacity preserved by widening them and increasing the depth of the wheel, there being three rows of buckets, and, in connection with them, a system of internal casing; the object of thus constructing a water-wheel being to utilize to the fullest extent the power of water during dry seasons, and to take advantage of small streams, inasmuch as, by the use of the outside casing, every drop of the water can be saved, and a great amount of leakage prevented.

For low heads the wheel is constructed to work on a vertical shaft, *m*, outside the internal casing *M q c* and guide-boxes.

The rim of the wheel is made very wide, and is provided with three separate rows of shallow internal buckets *H W S*, the central row, *W W*, receiving the water from the internal guide-boxes, and discharging it at the periphery of the wheel, whence it escapes at the bottom, the upper row, *S*, receiving the water in the same manner, and discharging it at openings at the top, whence it falls down the outside or end of the wheel, as its construction may be, and the lower row, *H*, receiving the water in the same manner, and discharging it directly into the waste-way, through openings at the bottom of the wheel.

The central row is inclosed between two internal projecting rings, *y y*, the other rows lying between the rings and the upper and lower edges of the rims respectively; said row is constructed of a series of single curved plates *g*, fig. 2, their inner ends being flush with the inner edges of the rings *y*, and their outer ends being flush with the outer surface of the rings.

The side buckets are made very deep, and are quite narrow. The vertical depth of the wheel is nearly equal to three-fourths of its inside diameter.

The wheel works on the outside of the internal cas-

ing, which it closely fits, and the water is let upon it through a series of openings, *b b*, around the interior of the casing, and directed upon the buckets *H W S* by means of curved guides.

A ring-gate, 12 12, is arranged inside of the guides, which it closely fits, and is opened and closed in any convenient manner. When only a small amount of power is required the ring-gate 12 12 is raised to the width of the lower row of buckets. When two-thirds of its power is required, the gate is drawn to the width of the middle row of buckets. When the whole power of the wheel is required the gate is drawn the whole width of the buckets.

The hub 15, plate 17, and rings 16 16, are secured to the inner edges of the buckets *H*.

The ring *M M*, fig. 1, with projecting flange *a a*, internal projecting flange *g g*, and curved plate *c c*, are so arranged as to form the internal casing and guide-box.

The passages *b b*, fig. 1, are not wide enough to admit the water to the whole width of the buckets *H* and *S*, but only to about one-half this width.

The water is delivered to the whole width of the central buckets *W W* when the wheel is constructed to work under very low heads.

The bridge-tree or tripod *t* that supports the lower end of the shaft *m*, is constructed and arranged so that its legs fit the under side of projecting flange *a a*, fig. 1. The tripod is designed to support the wheel when it is practicable or desirable to dispense with the casing.

This arrangement offers little obstruction to the discharge.

It is a well-known fact among mill men that water-wheels constructed to work under low heads, of from two to four feet fall, require to be constructed so as to use a great many cubic feet of water per minute, and the less the water is retarded in flowing away from the wheel the greater the gain.

When the wheel is constructed to work in a vertical shaft, under high heads, it is arranged inside a cylindrical tube, 22, with flanges, *x x*, at each end, which are attached to the projecting flanges *a a*, fig. 2, of the internal casing. At the opposite end the bridge tree *G G* is arranged that supports one end of the wheel-shaft *m*, and at this end a flange is arranged to receive the end of the draft-tube when the wheel is set to work.

To the opposite side of projecting flange *a a* the cylindrical casing-tube *z z* is attached, at right angles with the head 21, the branch pipe 19 19 being arranged with flange 20 to receive the supply-pipe.

When the wheel is constructed to work in a horizontal shaft both sections of the cylindrical casing-tubes are changed from a vertical to a horizontal position.

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

1. The combination of three separate rows of internal buckets H W S, H having a downward, S and upward, and W a circumferential discharge, as shown and described.

2. The combination of the rim P P with the rings *y y* and buckets H W, as and for the purpose described.

3. The arrangement of the plate *l l*, hub 15, and projecting ring 16 16 with the buckets H, as and for the purpose set forth.

4. The ring M M, provided with projecting flanges

a a and internal projecting flanges *g g*, and combined with the curved plate *c c*, the whole forming the internal guide-box, when constructed and arranged as shown and described.

5. The combination with the internal water-wheel and internal casing, of the outside casing, constructed and arranged as shown and described, as and for the purpose set forth.

To the above specification of my invention I have set my hand this 28th day of September, 1869.

Witnesses:

H. W. SHIPLEY.

O. M. CARTER,

T. J. CARTER.