

D. K. Kraatz.

Turbine Water Wheel.

N^o 20,921.

Patented Jul. 13, 1858.

Fig:1

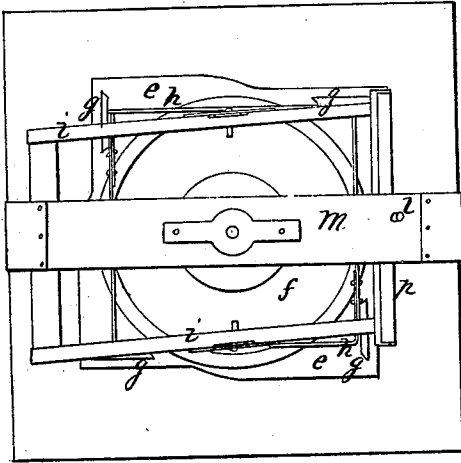


Fig:2

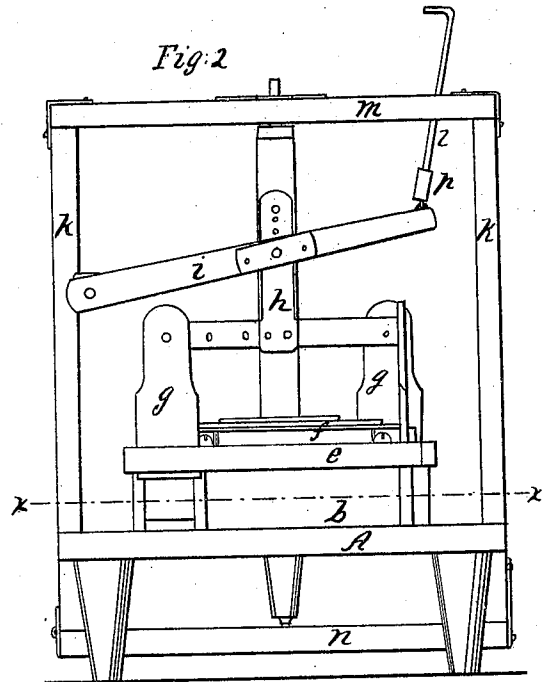


Fig:4

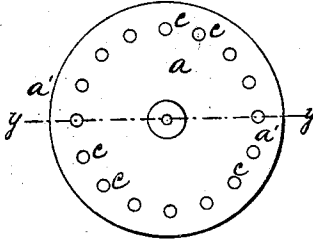


Fig:5

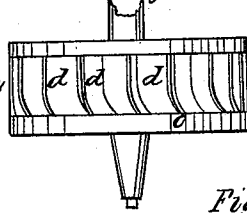


Fig:6

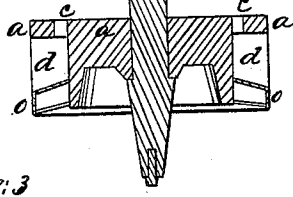
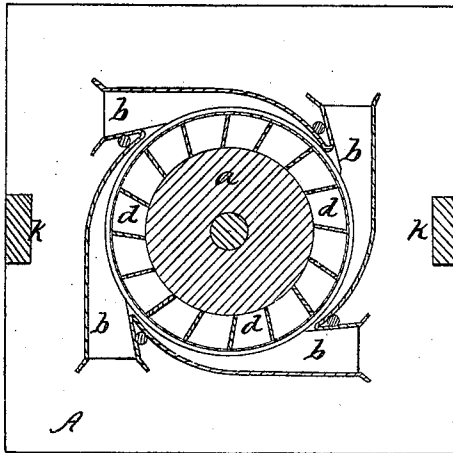


Fig:3



UNITED STATES PATENT OFFICE.

DAVID K. KRAATZ, OF EPHRATA, ASSIGNOR TO HIMSELF, AND ISAAC S. ROLAND, OF BAREVILLE, PENNSYLVANIA.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 20,921, dated July 13, 1858.

To all whom it may concern:

Be it known that I, DAVID K. KRAATZ, of Ephrata, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Improvement in Water-Wheels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

Figure 1 is a top view of my improved water-wheel and its casing; Fig. 2, a side view of the same, and Fig. 3 a section in the line *x x* of Fig. 2. Fig. 4 is a top view of the wheel detached from its casing; Fig. 5, a side view of the said detached wheel, and Fig. 6 a section in the line *y y* of Fig. 4.

Similar letters indicate like parts in each drawing.

The body *a* of my improved water-wheel is of a cylindrical shape, and it has an annular flange *a'* radiating from the upper end thereof. The buckets *d d* of said wheel descend vertically from the under side of the flange *a'* for about two-thirds of their length, and then they curve forward the remaining portion of their length, and the lower extremities of said buckets are embraced by the band *o*, whose diameter corresponds with that of the flange *a'* of said wheel. At the upper end of the face of each bucket a perforation is formed in the flange *a'*, the use of which will be hereinafter explained.

The casing, &c., of my improved water-wheel is combined with the platform A in the manner represented in the drawings. The posts *k k*, which are firmly secured to the sides of the platform A, descend below the said platform a short distance, and the lower ends of said posts are secured to the beam *n*, which contains the bearing-box or pivot for the lower end of the shaft of the water-wheel. The upper ends of the posts *k k* are connected to each other by the cap *m*, which contains the journal-box for the upper end of the water-wheel shaft. The bearings of the shaft of the water-wheel are so located as to bring the band *o*, which embraces the outermost lower angles of the buckets of said wheel, into the aperture in the platform A, where the said band fits as closely as it can conveniently be made to do without producing friction.

The buckets of my improved water-wheel are surrounded by a casing, which is of such a shape as to form four water-ways *b b*, whose mouths can be closed by the gates *g g*. The water-ways formed by the said side casing of the water-wheel are closed at top by the perforated plate *e*, which is combined with said casing in any suitable manner. The central perforation in the plate *e* is closed by the cap *f*, which is centrally perforated for the purpose of allowing the shaft of the water-wheel to pass through the same. Apertures are formed in the angles of the plate *e* for the gates *g g* to pass through into the mouths of the water-ways *b b*. Opposite pairs of the said gates are combined with each other and with an operating side lever *i* by means of the three-armed connecting-pieces *h*, as shown in Fig. 2, and the said side levers *i i* are hinged to the cross-bar *p*, which may be connected to a suitable outside lever by means of the vertical rod *l*, that passes through a guiding-aperture in the cap *m*, which surmounts the side posts *k k*.

Now in practically operating my improved water-wheel I find that when the spaces between each pair of buckets is closed air-tight by the flange *a'* the water is retained for such a length of time in said spaces as to materially retard the movements of the wheel and cause a considerable loss of power. This defect, which existed in the wheels first constructed by me, I have entirely remedied by means of a series of perforations *c c* in the flange *a'* and the close air-chamber immediately over said wheel. It will readily be perceived that when the water first strikes against a bucket it will drive a current of air violently upward through the aperture in the flange *a'* at the upper end of said bucket, which will produce a pulsation of the atmosphere within the air-chamber above the wheel of sufficient force to drive the dead water out from the spaces between the preceding buckets of said wheel.

The casing of my improved water-wheel may be constructed in any manner that may be deemed expedient, provided it be supplied with an air-chamber immediately over said wheel.

Having thus fully described my improve-

ment in water-wheels, what I claim as my invention, and desire to secure by Letters Patent, is—

The perforated flange *a'*, which closes the spaces between the upper ends of the series of buckets *d d* when the perforations in the said flange are made to open into a close air-chamber, substantially in the manner and for the purpose herein set forth.

The above specification of my improvement in water-wheels signed and witnessed this 15th day of April, 1858.

DAVID K. KRAATZ.

Witnesses:

JOHN PEIFFER,
JACOB KEMPER.