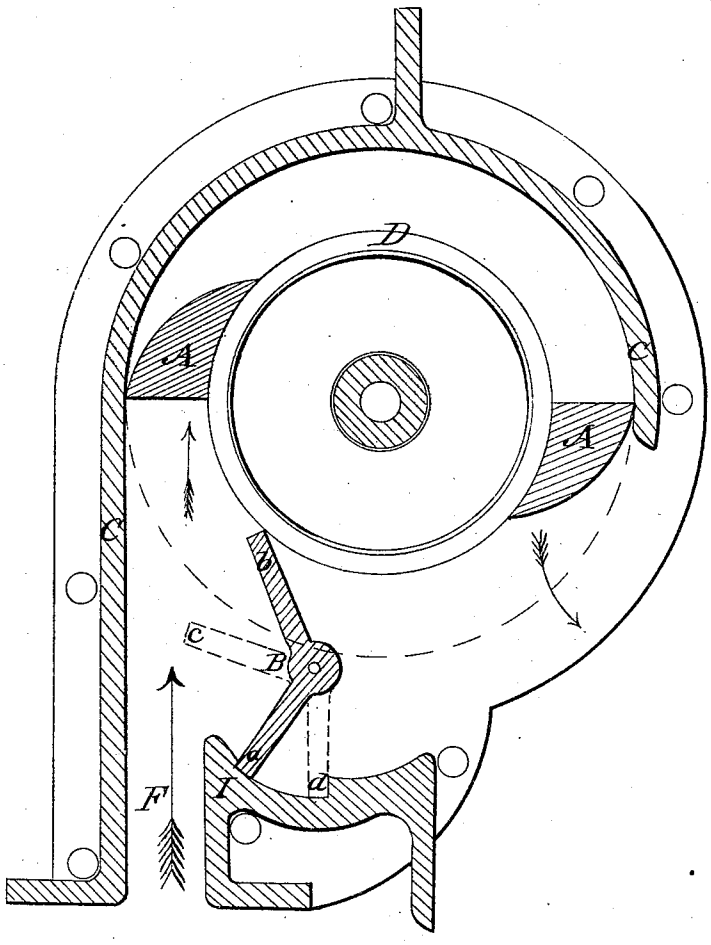
Fields & Gerhard,

Water Wheel,

No. 13,458, Patented Aug. 21, 1855.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM FIELDS AND SOLOMON GERHARD, OF WILMINGTON, DELAWARE.

PRESSURE WATER-WHEEL.

Specification of Letters Patent No. 13,458, dated August 21, 1855.

To all whom it may concern:

Be it known that we, WILLIAM FIELDS and SOLOMON GERHARD, both of the city of Wilmington, in the county of Newcastle and State of Delaware, have invented certain new and useful Improvements in Water-Wheels; and we hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, which represents a longitudinal section of the wheel and casing, showing the action of the valve.

The nature of our invention consists in combining with a water wheel, running in a case or chute, a balance valve hinged in the center constructed and arranged as hereinafter described, and set forth.

We construct our improved water wheel as follows, viz: Upon a shaft E, we place a wheel D, having two buckets A equi-distant upon its periphery. The faces of the buckets upon which the force of the water acts, are perpendicular to the periphery of the wheel, while their rear sides are inclined in a convex curve nearly tangential thereto. They extend across the width of the wheel, and are inclosed at the sides by a suitable casing, fitting nearly water tight thereto. These side casings with another part between them semi-cylindrical, and concentric with the wheel, and continued on the upper part horizontally, form the water chute or scroll case, having its inlet at F and its outlet at G. The edges of the buckets fit closely to the semi-cylindrical casing C. Another piece I, forms the bottom of the inlet.

A valve or gate B moves upon gudgeons having their bearings in the side casings. Its section shows two leaves forming with each other an angle of about 120 degrees moving upon its apex, the leaf *a*, working in a concentric seat, having two shoulders to limit its action. This valve is opened by the inclined side of each bucket when the wheel is in motion, and presents several advantages over a valve hinged at one edge; for instance the pressure of the water above the valve is nearly balanced, requiring very little loss of power in opening it, and again the movement of the leaf *b*, to *c* displaces a certain quantity of water, which is immediately accommodated in the space simultaneously afforded by the movement of the leaf *a*, to *c*. The valve is closed after the passage of the bucket, by the current.

Having thus fully described our invention what we claim as new and desire to secure by Letters Patent is—

The combination of the valve B constructed and arranged substantially as described, with the buckets A upon the wheel D revolving in the case C, as herein specified.

WILLIAM FIELDS.
SOLOMON GERHARD.

Witnesses:
P. COUNTISS,
WM. F. O. DANIEL.