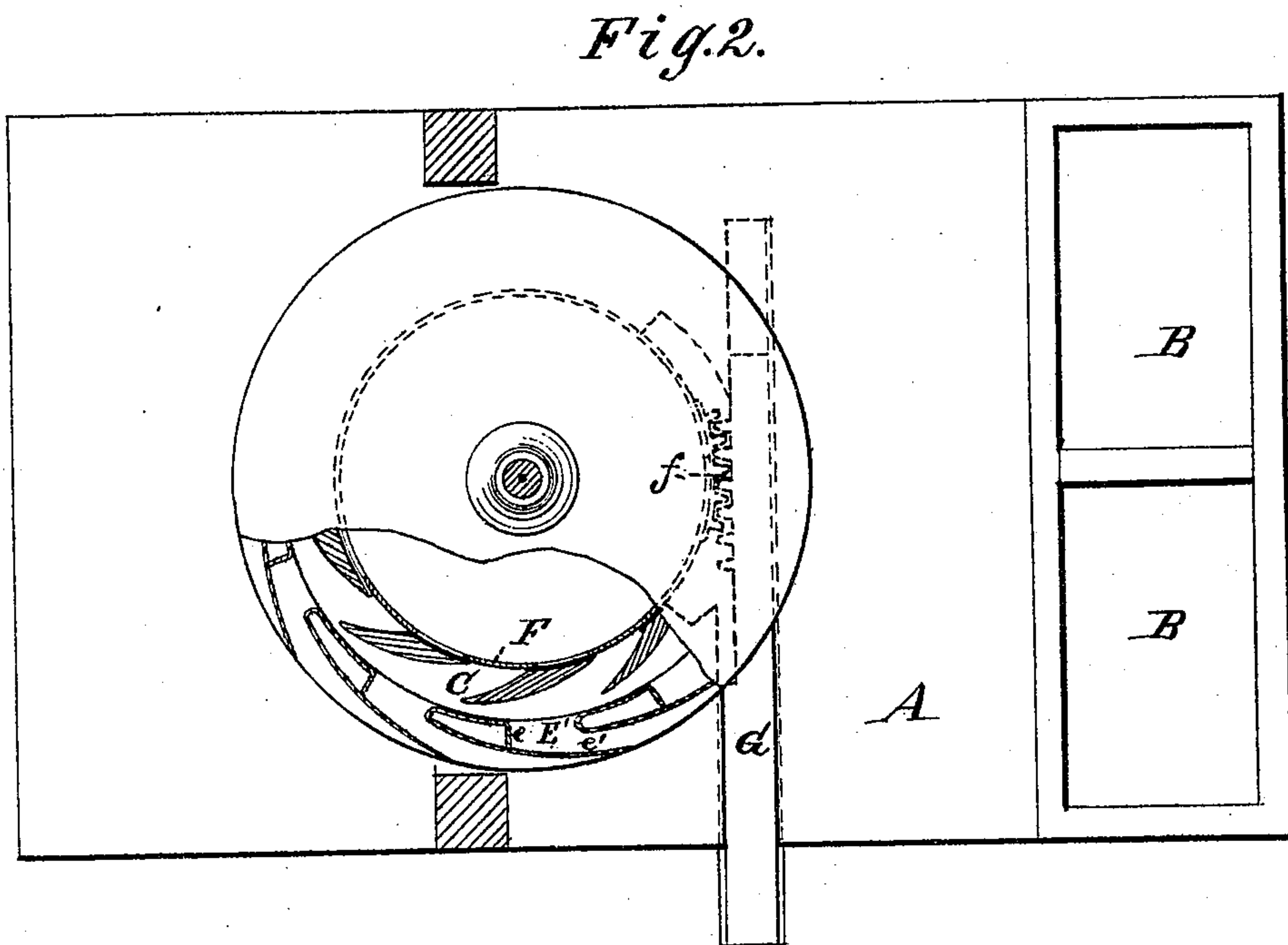
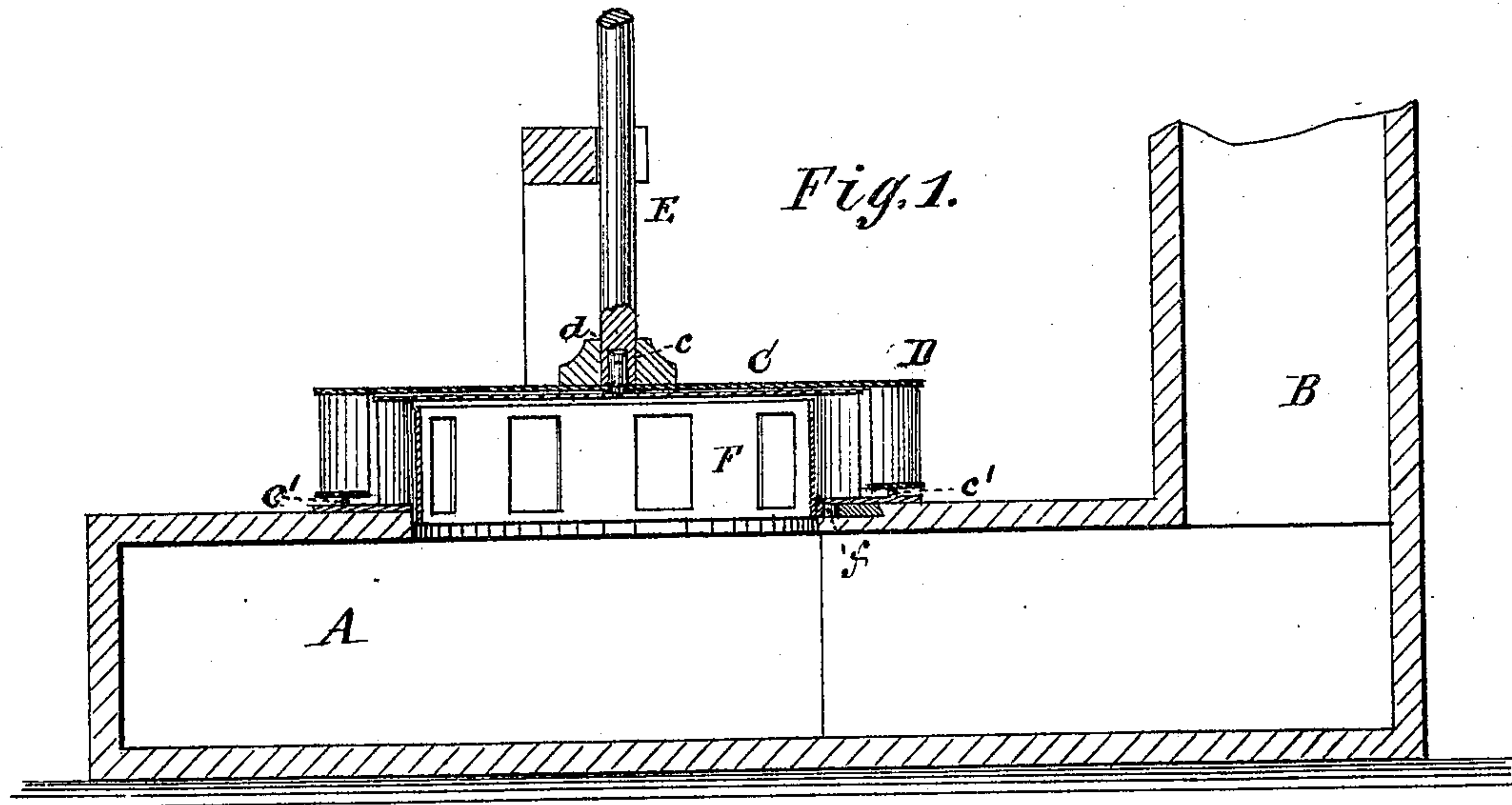


J. MCGREW.
Turbine Water-Wheels.

No. 133,470.

Patented Nov. 26, 1872.



Witnesses:
G. Mathys.
John Chemon

Inventor:
John McGrew
PER _____
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UNITED STATES PATENT OFFICE.

JOHN MCGREW, OF RAVENSWOOD, WEST VIRGINIA, ASSIGNOR TO HIMSELF
AND MARGARET J. SMITH, OF SAME PLACE.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. 133,470, dated November 26, 1872.

To all whom it may concern:

Be it known that I, JOHN MCGREW, of Ravenswood, in the county of Jackson and State of West Virginia, have invented a Turbine Reaction Water-Wheel, of which the following is a specification:

The invention consists, first, in combining with the inner chute of a turbine-wheel a series of peculiarly-constructed buckets, that, by their relation to the discharge apertures, utilize all the pressure of the water; second, it consists in providing the chute-ring with a vertical circular flange, by which great steadiness and uniformity of motion are secured to the wheel.

Figure 1 is a vertical central section, and Fig. 2 a plan view, partly broken away, of my invention.

A represents the chamber, in which the water is received through channel-ways B B; and C is the chute-ring, which is made fast to the top of chamber A, is provided with step *c*, on which the wheel turns, and has an upward annular flange, *c'*, that guides the wheel and prevents it from wobbling on the step. D is the wheel, having shaft E, that actuates machinery connected therewith, and bearing *d*, that fits about the step *c*. E' are the buckets, angled so that the water that has passed over surface *e'* will press against the short arm *e* of the plane angle. The surface of this short arm is in area about one-eighth larger than the transverse area of the aperture through

which the water is discharged, so as to prevent any counter-pressure in a direction opposite to that in which the wheel is moved. F is an adjustable gate placed on the inside of chute-ring, and provided with spurs *f* on an arc of its periphery, which gear with a reciprocating rack, G, placed in the frame of chamber A.

The operation is as follows: The water enters through channel-ways B B, is received into chamber A, passes through gate F, and is guided by chutes of ring C toward and into the buckets. Here, pressing against the whole area of arm *e*, while all pressure opposite thereto is entirely removed by the discharge-aperture, the wheel is compelled to turn.

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

1. The combination of an inner chute-ring, C, with buckets E having a surface-area, *e*, bent at an angle to surface *e'*, and slightly larger than the transverse area of the discharge aperture, as and for the purpose described.

2. The chute-ring C provided with the vertical annular flange *c'*, as and for the purpose set forth.

JOHN MCGREW.

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