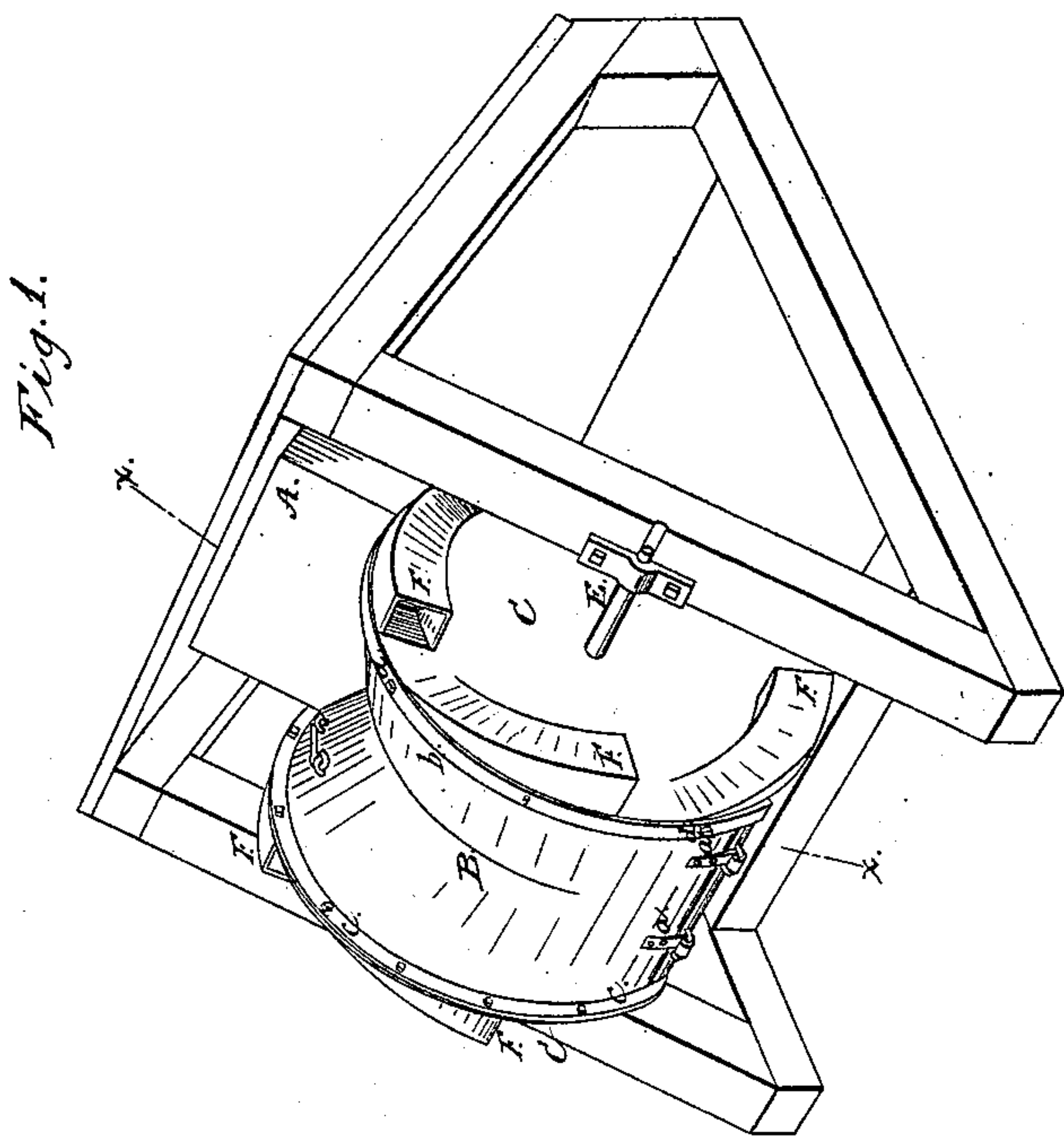
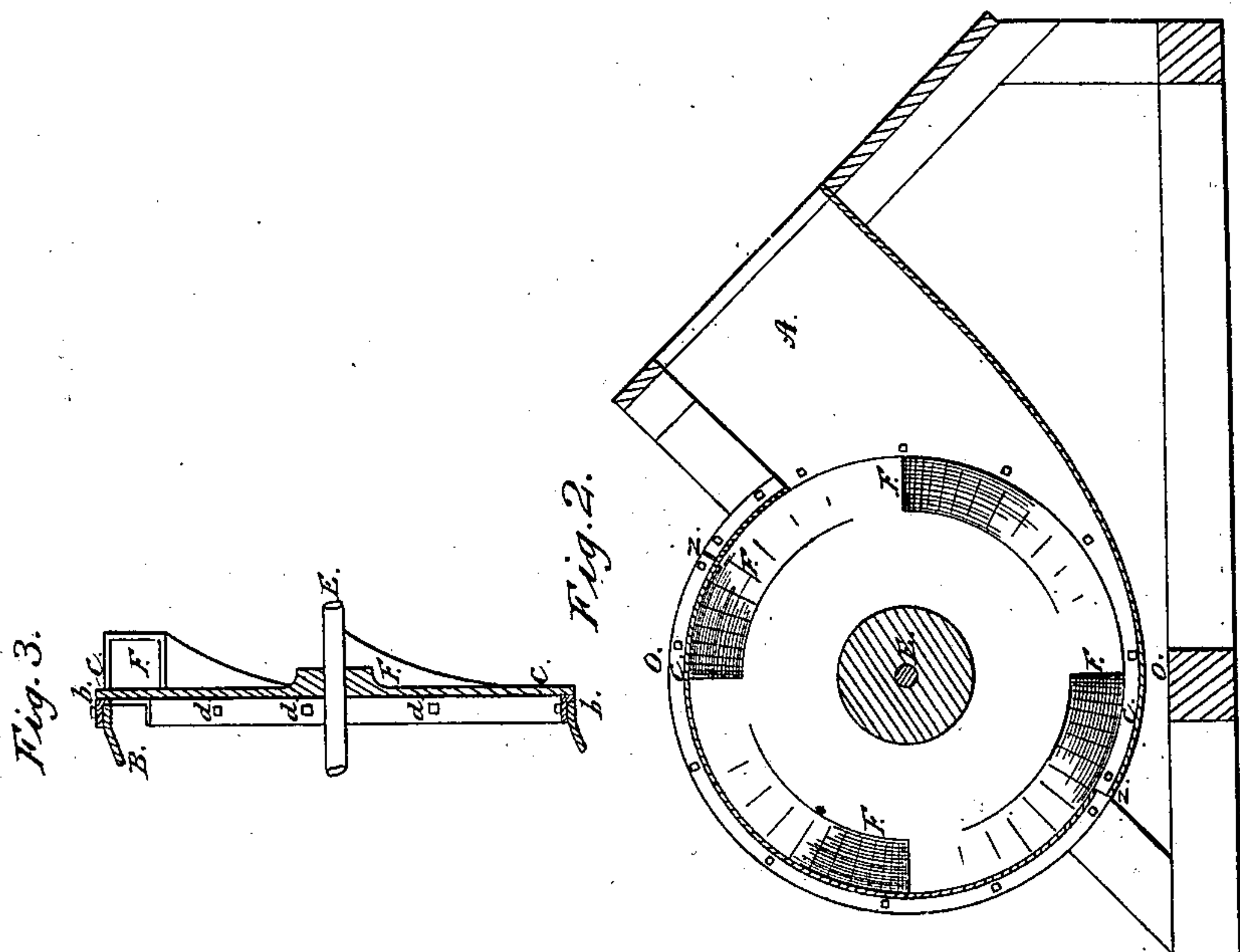


E. Smith,

Water Wheel,

Patented Oct. 12, 1852.

N^o 9,335.



UNITED STATES PATENT OFFICE.

ERASMUS SMITH, OF NORWICH, NEW YORK.

PACKING WATER-WHEELS.

Specification of Letters Patent No. 9,335, dated October 12, 1852.

To all whom it may concern:

Be it known that I, ERASMUS SMITH, of Norwich, in the county of Chenango and State of New York, have invented certain
5 new and useful Improvements in Water-Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in
10 which—

Figure 1 is a view in perspective of the wheel, and Fig. 2 a vertical section through the line $x x$ of Fig. 1; Fig. 3, a vertical section of the wheel and its case in part taken
15 through the line $o o$ of Fig. 2.

The wheel as represented in the drawing, to which my improvement is applied, in its general construction and arrangement is of a well known form, and is fed by a trunk A,
20 which enters a fixed cylindrical chamber B, whose ends are occupied by revolving disks C C, that constitute the wheel, and which move in unison, being mounted upon the same shaft E. The water rotates the wheels
25 C C by its pressure against the inclined sides of the curved projecting mouths or outlets F. To obtain a full, effective force with wheels of this description it is necessary that no escape of the water from the chamber B
30 should occur except through the buckets or outlets F. Therefore it is important to keep the wheels C C in close contact with the edges of the chamber B, against which they rub in rotating, to avoid leakage through
35 the joints between the wheels and the edges of the chamber. I accomplish this object by inserting suitable packing between the chamber and wheels fitted to or on the edges of the chamber B. This packing has hitherto
40 been arranged on the exterior or around the outer circumference of the chamber B, but it is found that this arrangement is very defective, and does not admit of that facility of adjustment to compensate for wear which
45 is necessary, as by the position of the wheel, which is immersed for a portion of its depth or diameter in the "tail water", it is a matter of great difficulty and generally impracticable to set up the packing as the wear
50 requires beneath the lower portion of the chamber, because to get at this portion of it from underneath the operator would have to work under water, which is both inconvenient and injurious to health and is generally
55 omitted. Consequently the most wasteful leakage that could occur in connection

with the packing takes place unchecked, for it happens where the pressure of the water by its fall is greatest and of course its power to escape the strongest. This leakage there-
60 fore detracts most materially from the available power of the wheel, and where water is scarce is a serious evil. To remedy this defect is the main object of my invention, which consists in arranging the pack-
65 ing in such manner that it can be set up from the interior of the chamber B against the lower portion of the periphery of the wheel, and on the exterior of the chamber against the upper portion of the periphery
70 of the wheel.

The upper half of the shell of the chamber B is hinged at $a a$ so that it may be opened for getting with facility to the pack-
75 ing arranged around the lower half of its periphery. The packing around the edges of the chamber for keeping the joints with the wheels C C tight may be either circumferential or radial, that is may be either ar-
80 ranged to be set up by moving radially outward from or toward the center of the wheel, or be adjusted by sliding or setting them up in a direction parallel to the axis of the wheel, the packing b having this latter
85 movement, while the packing c on the opposite side or edge is fitted so as to be adjustable radially, the packing b having slots in it through which the bolts d securing it to the chamber are fitted, the said slots serving
90 to admit of the packing being set up as may be necessary to compensate for wear.

The packing may be made of the same material as ordinary water packing, the important novelty being in the arrangement for setting up. The packing of the upper
95 half or portion of the chamber B is arranged for adjustment from the outside, but for the convenience of setting up the packings on the lower half or portion of the chamber the packing is arranged so that it may be set up
100 from the interior, as represented more particularly in Fig. 3. In thus referring to the upper and lower half or portion of the chamber, the division as regards the ar-
105 rangement of the upper and lower packing is supposed to take place at the small double lines marked $z z$ in Fig. 2. This arrangement for setting up the packings will be found exceedingly convenient, insomuch that the packings on the upper portion or
110 half of the chamber may be set up from the outside at any time and while the wheel is

working, and by shutting off temporarily the supply of water and allowing the chamber B to empty itself through the wheel the packings of the lower portion or half of the
5 chamber may be readily got at for adjustment from the interior by opening the upper or hinged portion of the case, and thus though the wheel and its chamber be partially immersed the lower packing may be
10 readily got at by suitable instruments from the interior, whereas if the packing was on the exterior of the lower part, as it is on the upper part, it could not be adjusted from the exterior, so that the entire circumference of
15 the packing on either edge of the chamber B against the wheel C C may with the greatest facility be adjusted from time to time to compensate for wear and thus prevent leakage.
20 Having thus described my improved

water wheel, what I claim as new therein and desire to secure by Letters Patent, is—

The arrangement of the packing between the edges of the chamber or case, and the wheels, in such manner that the packing on
25 the lower portion of the chamber is adjustable from the interior, while the packing around the upper portion of the chamber is set up from the outside of the said chamber substantially as specified, so that the whole
30 of the packing is on the upper side, and none of it under the case, and all capable of being set up or adjusted without the necessity of getting under the case.

In testimony whereof I have hereunto
35 subscribed my name.

ERASMUS SMITH.

Witnesses:

N. B. HALE,
JOHN F. HUBBARD.