

No. 630,441.

Patented Aug. 8, 1899.

O. BECKMANN.
WATER METER.

(Application filed June 24, 1898.)

(No Model.)

Fig. 1.

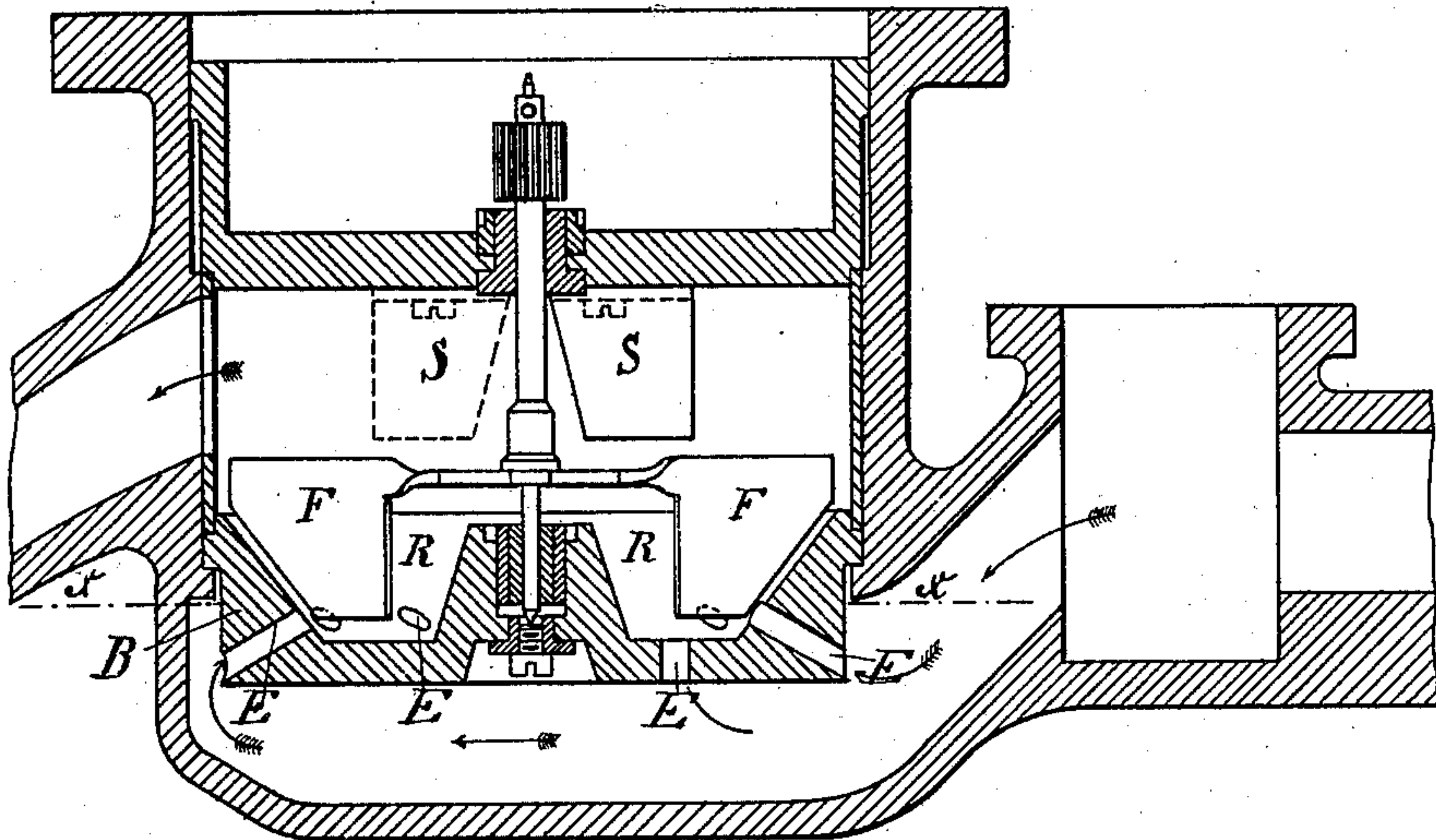
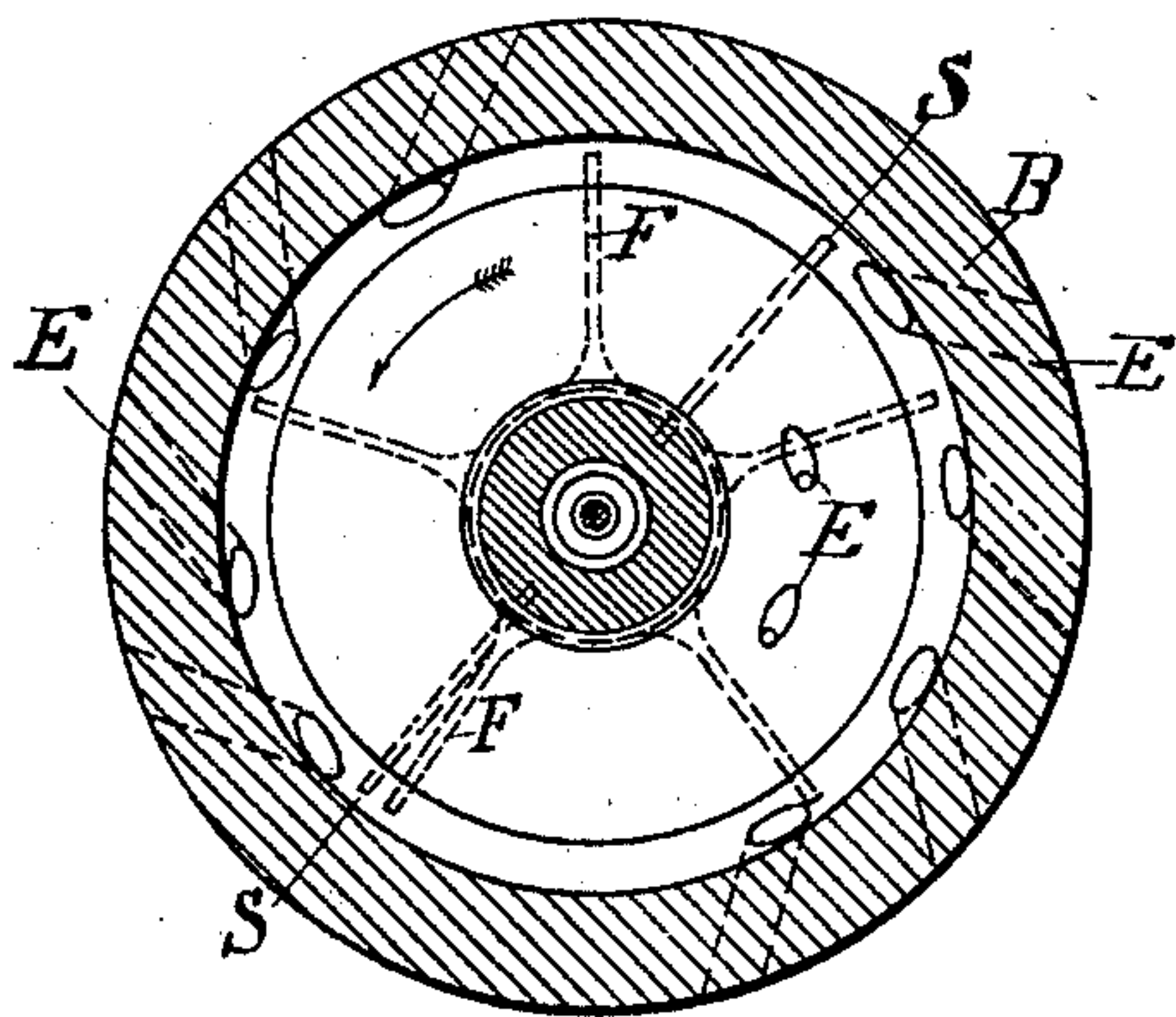


Fig. 2.



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UNITED STATES PATENT OFFICE.

OSWALD BECKMANN, OF BRESLAU, GERMANY, ASSIGNOR TO THE MASCHINENFABRIKEN, VORMALS GEBRÜDER GUTTMANN & BRESLAUER, METALLGIESSEREI ACTIEN-GESELLSCHAFT, OF SAME PLACE.

WATER-METER.

SPECIFICATION forming part of Letters Patent No. 630,441, dated August 8, 1899.

Application filed June 24, 1898. Serial No. 684,331. (No model.)

To all whom it may concern:

Be it known that I, OSWALD BECKMANN, a subject of the King of Prussia, Emperor of Germany, residing in Breslau, Prussia, German Empire, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification.

This invention relates to water-meters having a wing-wheel which is rotated by the water flowing through the meter-box. Water-meters of this kind hitherto known have the disadvantage that the wing-wheel makes on an average a high number of revolutions. Consequently the rotating parts wear out quickly. The cause of this great number of revolutions is that the water is compelled to exert its whole moving power or *vis viva* upon the wing-wheel in order to obtain sufficient power for driving the wing-wheel when the quantity of water flowing through the meter-box during a unit of time is small, so that sufficient exactness of measuring is maintained; but in order to prevent the apparatus indicating too much when the quantity of water flowing through the meter-box is great so-called "dam-wings" are used, which cause a stowing of the water and a checking of the measuring-wheel; but with this generally-adopted arrangement the number of revolutions was very high, as the usual shape of the measuring-chamber and of the wings did not allow making the size of the surface of the wings of the wing-wheel which is acted on by the water with regard to the stowing-surface of the dam-wings so as to suitably diminish the number of revolutions. A number of revolutions of the wing-wheel as small as possible and a measuring exactness as great as possible are obtained only when the stowing-surface is made large in relation to the surface of the wings of the wing-wheel which is affected by the water. With cylindrical measuring-chambers the bound or practical limit possible was very soon reached, as the arm of the lever of the power on which the entering current of water acts upon the wings of the measuring-wheel could not be made shorter than the arm of the lever of the power on which the water

stowed by the dam-wings acts for checking the wings of the measuring-wheel, so consequently the water which is not yet checked or hindered by the dam-wings exerts a considerably greater power upon the wing-wheel than the water which is already checked by the dam-wings exerts in opposition to the measuring-wheel.

According to the present invention the speed of rotation of the wing-wheel is diminished by making the power of the water which is stowed by the dam-surfaces and acts in a direction opposite to the direction of rotation of the wing-wheel only a little smaller than the power of the water veins or streams which strike directly against the wings of the wing-wheel.

In order to render my invention more easily intelligible, reference is had to the accompanying drawings, in which—

Figure 1 is a vertical section through the water-meter, and Fig. 2 is a horizontal section on the line *x x* of Fig. 1.

The wings *F* of the wing-wheel instead of being rectangular or nearly so are so shaped that the exterior edge of each wing *F* is sloped or beveled inward, and corresponding with the shape of the wing-wheel the lower inner part *B* of the meter-box is shaped conical on its inner wall. The channels or passages *E* for the entrance of water are arranged in the lower conical inner part *B* of the meter-box tangentially to the wing-wheel and obliquely upward, as will be seen in Fig. 2, so that the water streams which enter through the said passages into the measuring-chamber *R* strike against the wings *F* of the wing-wheel at the lowest part, near to the sloping exterior edge, and consequently at the place where the radius of the wing-wheel is the smallest. The water streams flow upward parallel to the generatrix of the conical inner wall of the part *B* and leave the wing-wheels *F* where the diameter of the measuring-wheel (the wing-wheel) is the greatest. The streams continuing their way strike against the dam-wings *S*, which extend substantially as far outward from the center or axis of the water-wheel as the wings *F*, (see Fig. 2,) which dam-wings

throw water back against the wheel-wings at the parts of greatest length. Two dam-wings S are used diagonally opposite each other, as shown in Fig. 2. In Fig. 1 the dam-wing at the left should not be shown, to be strictly accurate, since said dam-wing is cut away by the plane of section on which the view is taken. It is, however, shown in dotted lines to indicate its position in relation to the dam-wing at the right. Thus the water streams thrown back by the dam-wings S strike against the wheel-wings F at points which have a greater distance from the axis of rotation of the measuring-wheel than the points of the wheel-wings F which are struck by the direct water streams. Therefore the back action of the water becomes so great that it is only a little smaller than the direct action of the water streams.

From the construction described it follows that the current driving the wing-wheel will be a very small one, indeed so small that the revolutions of the wing-wheel are reduced to less than a half of the revolutions of many of the old wing-wheels.

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

In a water-meter the combination of a wing-wheel the wings of which are beveled or inclined inward and downward at their exterior edges, a meter-box, the lower part of which is shaped correspondingly conical at its inner side wall, channels E for the entrance of the water arranged in the lower part of the meter-box tangentially and obliquely upward and directed toward the wing-wheel at its end having the smaller diameter, and dam-wings arranged above the wing-wheel and extending as far outward from the wheel-axis as the wheel-wings and fixed to the upper wall of the meter-box, substantially as and for the purpose specified.

Signed at Breslau, Germany, this 9th day of June, 1898.

OSWALD BECKMANN.

Witnesses:

EUGEN WEIMAR,
EMIL RINGIER.