J. A. STENBERG.

Rotary Engine and Meter.

No. 161,909. Patented April 13, 1875.

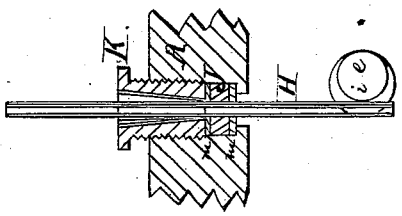

Fig. 3.

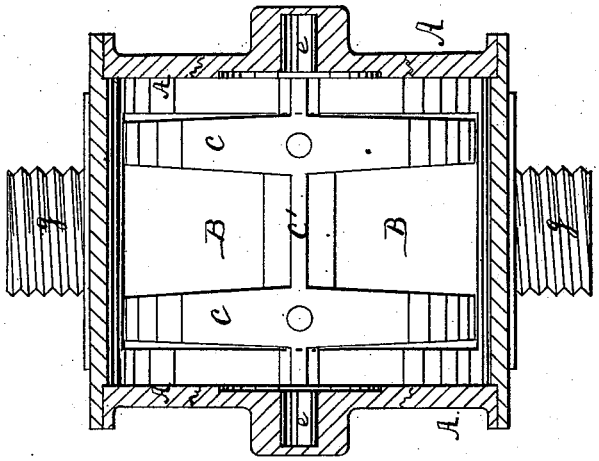

Fig. 2.

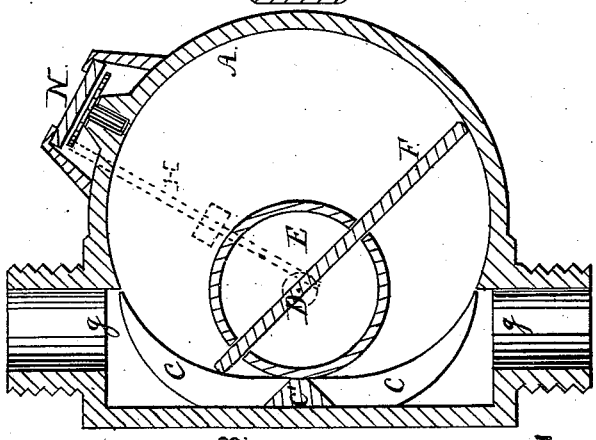

Fig. 1.

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UNITED STATES PATENT OFFICE.

JOHN A. STENBERG, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN ROTARY ENGINES AND METERS.

Specification forming part of Letters Patent No. **161,909**, dated April 13, 1875; application filed November 23, 1874.

CASE 1.

To all whom it may concern:

Be it known that I, JOHN A. STENBERG, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Rotary Engines and Meters, of which the following is a specification:

This invention relates to that class of rotary engines or meters in which a diametric wing, passing through a slotted shaft or small interior cylinder, rotates within a chamber of a peculiar form, such form that it shall be the same diameter in every direction when measured through the center of the before-mentioned slotted shaft or cylinder, which is located eccentrically.

In this improvement I first make a chamber of a true cylindrical form, having a cavity or recess at one side, which contains the ingress and egress apertures, and act as a sand-trap. Within this recess, which extends the entire length of the cylinder, or nearly, I fix a removable guide piece or pieces, and a longitudinal bearing-strip, the latter extending the entire length of the cylinder, and serving as a division between the ingress and egress ports. Within the peculiarly-formed chamber thus produced I place the usual small cylinder or large shaft, slotted its entire length for the passage of the usual diametric wing. This slotted cylinder, at one side along its whole length, fits closely against the afore-mentioned bearing and division-strip, and should be preferably recessed into the heads of the larger cylinder or chamber. The guide-strips are curved to continue the outline of the larger chamber, being so formed that when taken in connection with the circular form or true circle of the outer cylinder, they will produce the required geometric outline, which presents the same diameter in every direction measured through the center of the slotted shaft or small cylinder.

It will be readily understood that it is much more convenient and easy to make these detachable guide-pieces, which need only be narrow strips, than it would be to construct the whole side of the chamber of this erratic form. Greater accuracy may also be thus attained.

I find that it is desirable that the diametric wing, which extends the whole length of the cylinder, should be lighter than it is possible to make it of metal, to be perfect or more accurate as a meter. I therefore make said wing of vulcanized india-rubber—hard rubber—which approaches very nearly the specific gravity of water; and hence the apparatus is at no time rotated in the meter by reason of the weight of said wing. Other materials than vulcanite of the same specific gravity, and which will not warp or change, may be used; but I prefer vulcanite.

In the accompanying drawing, which forms a part of this specification, Figure 1 is a transverse central section of the apparatus; Fig. 2, a longitudinal section of the same with the inner or slotted cylinder and diametric wing removed. Fig. 3 is a sectional view, on a larger scale, of the apparatus for communicating motion to the register.

Like letters of reference made use of in the several figures indicate like parts wherever used.

In said drawing, A represents the outer cylinder, which is cast, turned, or worked into a true cylindrical interior, excepting the recess or cavity B at one side, which may be of any convenient form. C C are guide-strips, made separately from the cylinder A, and formed upon their concave sides of the curvature indicated at Fig. 1—that is to say, of such curvature as that, when applied within the recess B, as shown, they shall, added to the true circle of said cylinder A, produce an outline of a certain diameter measured through the center D in any direction. Said guide-pieces are placed within the recess B, and secured there in any appropriate manner, as is also the bearing-strip C′, which latter is placed within the plane of the curve of the guide-pieces and opposite said center D at the nearest point within said curve from said center. The ports *g g* enter the recess B, behind the guide-strip *c*, and said recess therefore acts as a trap to arrest and hold any particles of sand, &c., which may be carried through the pipes by the force of the water.

In meters of this class heretofore such solid particles have been carried into the meter, which is thereby clogged and worn out.

E is the usual slotted cylinder, through which passes a sheet or wing, F, made of hard rubber. The slotted cylinder E bears against the bearing-strip C′ throughout its whole length, thus separating the ingress and egress ports *g g*. The center of said slotted cylinder E coincides with the center D, and said cylinder E is borne at the ends upon pivots *e e*, one of which is cut with a cam, *i*, as shown at Fig. 3, upon which rests the end of a rod, H, which, at about the middle of its length, passes through a flexible rubber packing or washer, J, which is secured within the head-casing of the cylinder A, or otherwise attached to the cylinder-head, by the screw-thimble K, having a conical aperture to admit the free vibration of said rod. Above and below the rubber packing are metal washers *m m*, which serve to compress said packing, and render the joint tight against the escape of the contents of the cylinder A, while the flexibility of said packing permits a free vibration of the rod. The outer end of this vibrating rod is attached or connected to any ordinary registering mechanism, N. The position of the rod, &c., in relation to the other parts of my improvement, is indicated in dotted lines at Fig. 1.

The operation of this rotary engine or meter is like any other of its generic class, and will be fully understood by those skilled in the art without special description here, which is therefore omitted.

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

1. The cylindrical chamber A, constructed with the recess B at one side, to receive the guide piece or pieces C C, and the bearing-strip C′, and to act as a sand-trap, substantially as specified.

2. The diametric wing F, constructed of hard rubber, or material approximately of the specific gravity of water, to avoid movement of the parts by reason of momentum or preponderance of weight on one side of the axis, substantially as set forth.

JOHN A. STENBERG.

Witnesses:
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