(No Model.)

D. WILLIAMSON.

ROTARY ENGINE.

No. 375,788. Patented Jan. 3, 1888.

Fig. 1.

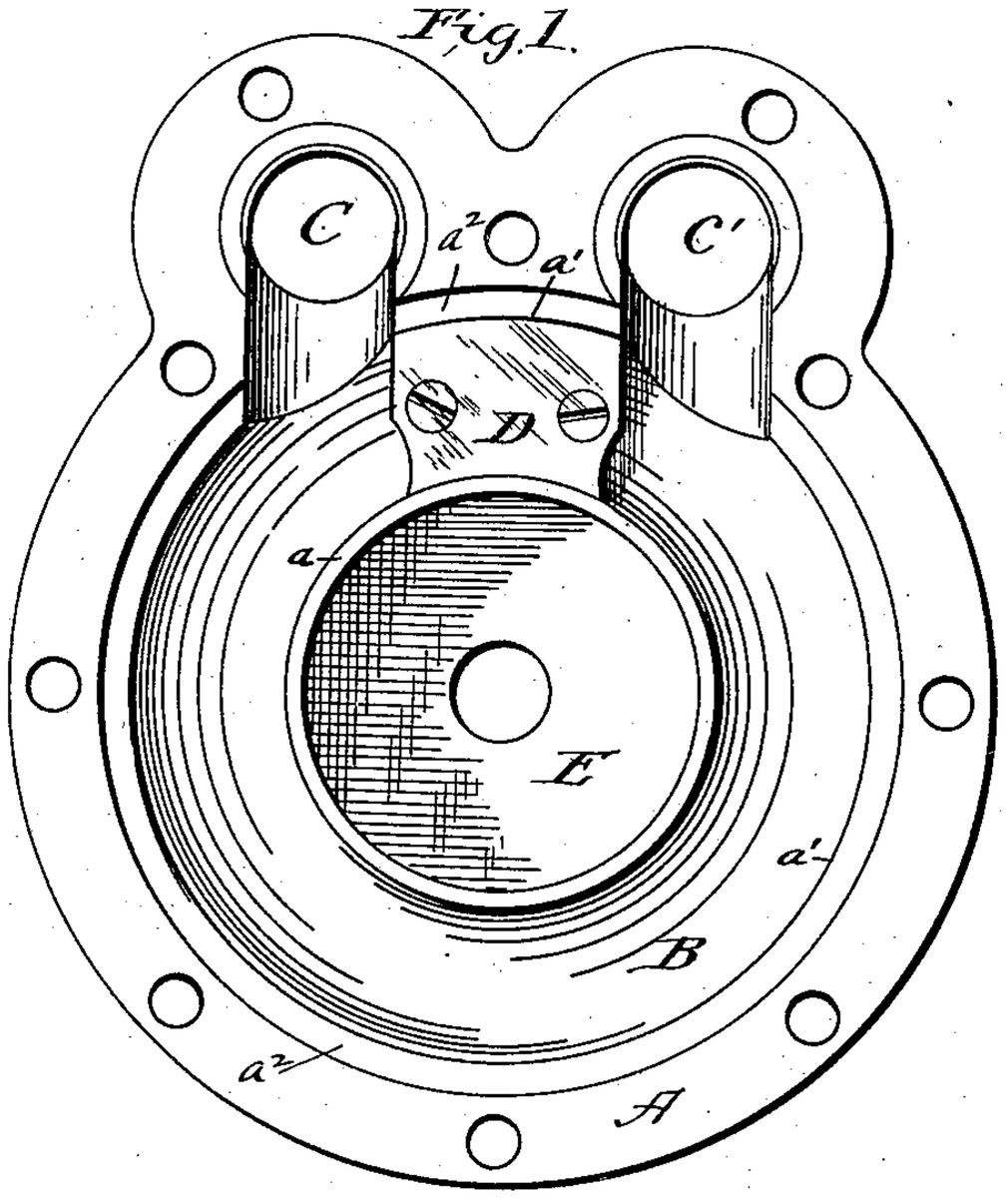
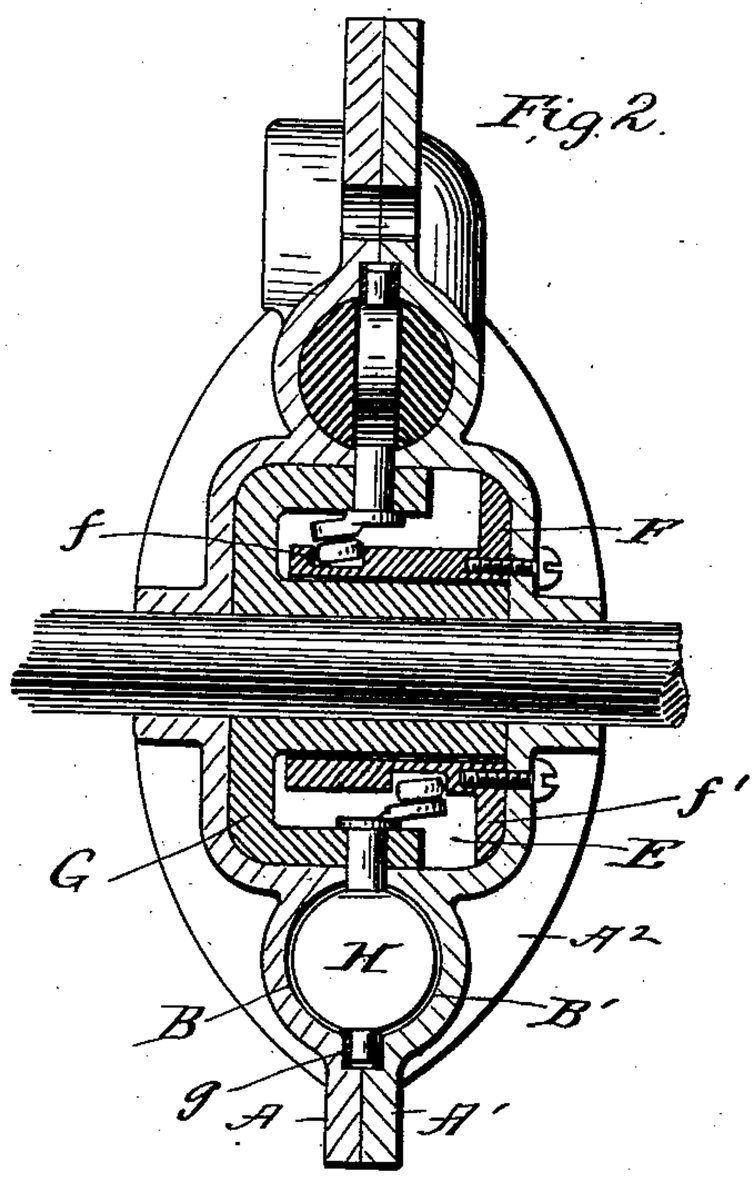


Fig. 2.



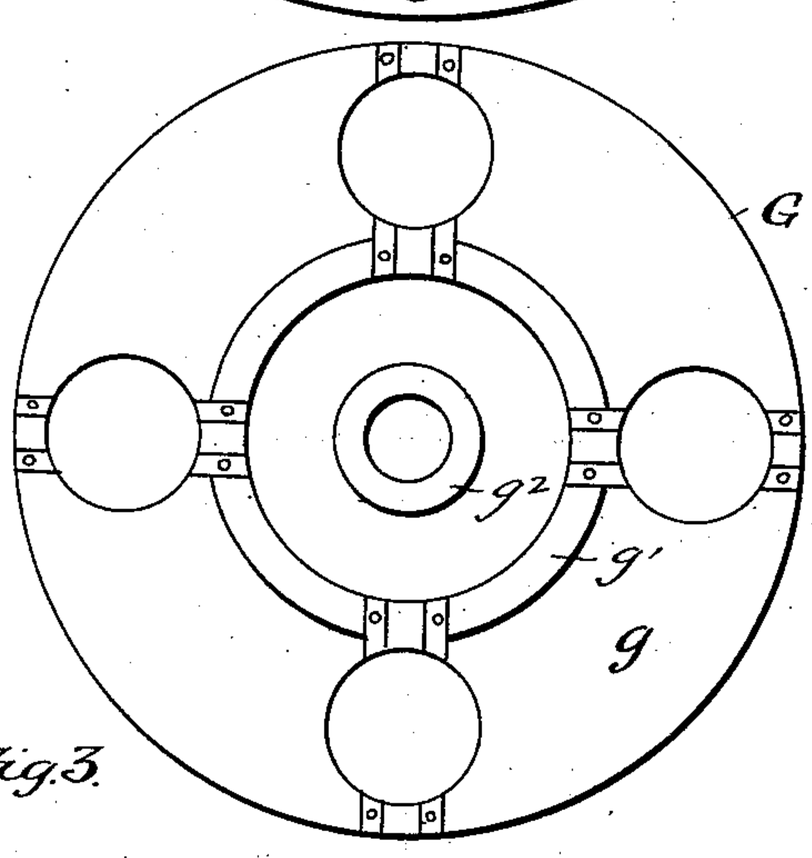


Fig. 3.

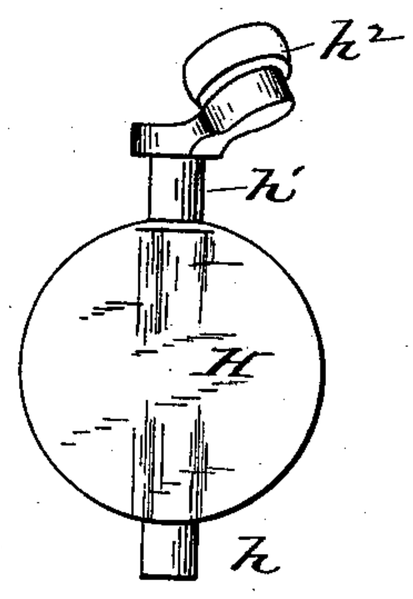


Fig. 5.

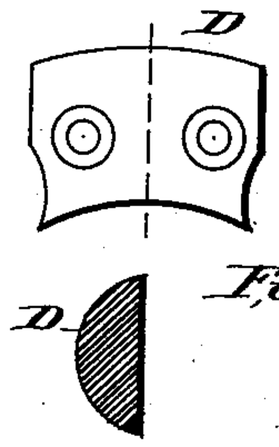


Fig. 6.

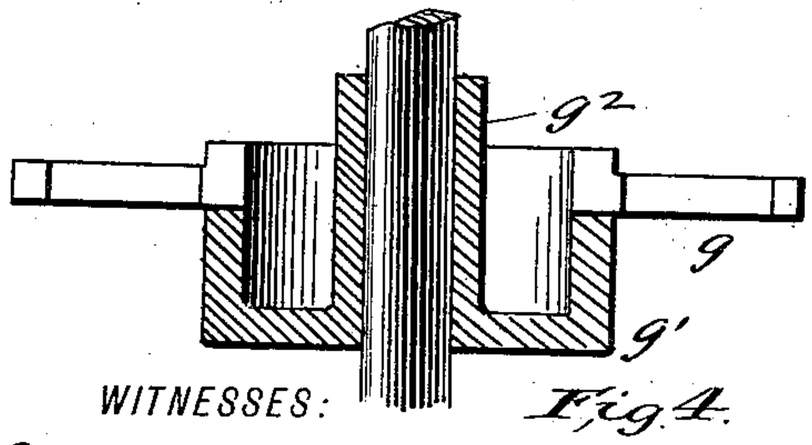


Fig. 4.

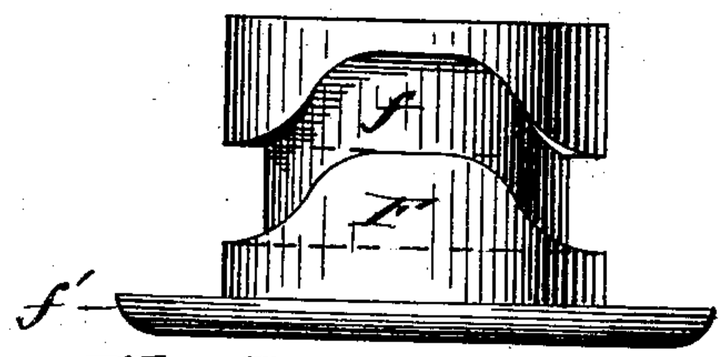


Fig. 7.

WITNESSES:

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DAVID WILLIAMSON, OF NEW YORK, N. Y.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 375,788, dated January 3, 1888.

Application filed September 14, 1887. Serial No. 249,652. (No model.)

To all whom it may concern:

Be it known that I, DAVID WILLIAMSON, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to rotary engines, and belongs more particularly to that class of engines which by slight alterations may be used as a meter, pump, or blower.

The object of the invention is to provide a device of this kind which shall have the fewest working parts possible consistent with easy running and efficiency of operation.

Broadly speaking, the engine consists of but three pieces—viz., a shaft, a casing, and a revolving disk carrying the vanes. There are, however, other details or attachments to these parts, which will be fully set forth in the following description, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a central section taken in the plane of the shaft; Fig. 2, a sectional view of the casing, the plane of division being at right angles to the shaft; Fig. 3, a face view of the revolving disk; Fig. 4, a central section of same; Fig. 5, a view of one of the vanes; Fig. 6, a face view and section of one half of the abutment, and Fig. 7 an elevation of the cam by which the vanes are feathered.

A and A′ represent the casing, and A^2 strengthening-ribs for the same. The casing is constructed in two parts which are facsimiles of each other, except as to that part which forms the inlet and outlet ports. As shown in Fig. 2, each part of the casing has an annular groove, B B′, which, when the parts are together, form an interior annular chamber or fluid-passage. The shape of a cross-section of this chamber is dependent on the shape of the vane used. I prefer a circular vane, and consequently the section would be a similar shape.

The inlet and exit ports C and C′, respectively, are located side by side and communicate with the fluid-chamber B on either side of a division wall or abutment, D. This abutment is also in two parts, filling the annular channel in each of the parts of the casing and facing up flush with the edges *a a′*. Thus when the two parts of the casing are together a space is left between the faces of the abutment. The edge *a′*, above mentioned, is formed on an annular groove, a^2, let into the face of each part of the casing, and a disk, which will be hereinafter described, moves through the space in the abutment and in this groove. Besides the fluid-chamber B, the casing has formed within it a central chamber, E, in which is located a cam, F, and a portion of the disk G. The cam is a casting, consisting of a sleeve having a peripheral cam-groove, *f*, and a flange, *f′*, which rests against the inner wall of the casing and is secured thereto by screws. The sleeve extends beyond the center line of the chamber, as shown.

The disk G consists of the flange *g* and the center box, *g′*, and sleeve g^2, all cast in one piece. The sleeve g^2 surrounds the shaft and is tightly secured thereto, while the box *g′* embraces the cam, allowing a small space between itself and the cam. The flange portion of the disk is perforated or provided with a number of holes in which play the vanes. The holes are of somewhat less diameter than the width of the flange, so as to have metal at the inner and outer edges in which to form bearings for the vanes H.

I do not limit myself to any particular form of vane, but prefer the form illustrated in Fig. 5. The vane proper is a disk of about the same thickness as the flange, and is made of such size as to about fill the opening. It is provided with a pintle, *h*, which runs in one of the bearings *g*, and with a neck, *h′*, which is journaled in one of the bearings formed in the walls *g′* of the box. The neck extends through the walls, and is provided with a crank which carries an anti-friction roller, h^2, running in the cam-groove *f*. The pitch of the cam-groove and the position of the cam are such that the vanes are given a quarter-turn while passing through the first quarter of the channel or chamber. They remain in that position until they reach the beginning of the last quarter, where they commence to fold in order to pass between the faces of the abutment.

The number of vanes used is preferably four, although any number consistent with the other proportions of the machine may be used. The rollers on all of the vanes run in the cam-groove, and their corresponding buckets are successively turned or feathered as the disk is rotated. It will be seen that the space between the faces of the abutment is kept constantly closed by the flange of the disk G; consequently the exit and inlet fluids cannot interfere with each other.

I do not confine myself to any particular form or dimensions of either fluid-channel, vanes, or cam, so long as the general principle is carried out.

The operation of this device, when used as a motor or engine, is as follows: The fluid under pressure enters from passage C to the chamber B B′ and fills the space on each side of the disk G. It forces itself against the first vane, which must be partially turned, and forces the disk around until the next vane has come through the space between the abutment, when it receives the pressure and adds as much more to the rotating power. When the first-mentioned vane reaches the abutment, it is closed up flush with the disk and slides through; but the fluid which has followed it exhausts through the port C′.

I do not wish to be understood as confining myself to the cam for feathering the vanes, as many other mechanical devices might be arranged. Pinions might take the place of the cranks, and racks could be so located as to engage with the pinions at the proper time and turn the vanes.

It is obvious that this machine could be utilized as a fluid-meter by determining the capacity of the chamber and attaching a gage to indicate the number of revolutions.

The apparatus might also be used as a pumping-engine or a blower with equal facility, and the claims which follow are meant to cover a construction which serves for such purposes.

Having described my invention, what I claim is—

1. In a rotary engine, a casing provided with an annular fluid-chamber, in combination with a concentric disk carrying vanes, the disk being located so as to divide the chamber into two parts, the fluid occupying the space on each side thereof, substantially as described.

2. A rotary engine consisting of a suitable casing provided with a fluid-chamber and inlet and exit ports, in combination with a disk carrying feathering vanes, and a device operating to feather said vanes.

3. In a rotary engine, a suitable casing provided with a fluid-chamber and with inlet and exit ports, an abutment located in said chamber between the inlet and exit passages in such a manner as to separate the inlet-fluid from the exhaust-fluid, the said abutment having a slit, and a vane-carrying disk running through said slit and the fluid-chamber, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DAVID WILLIAMSON.

Witnesses:
WM. A. ROSENBAUM,
AUGUSTUS MERRITT.