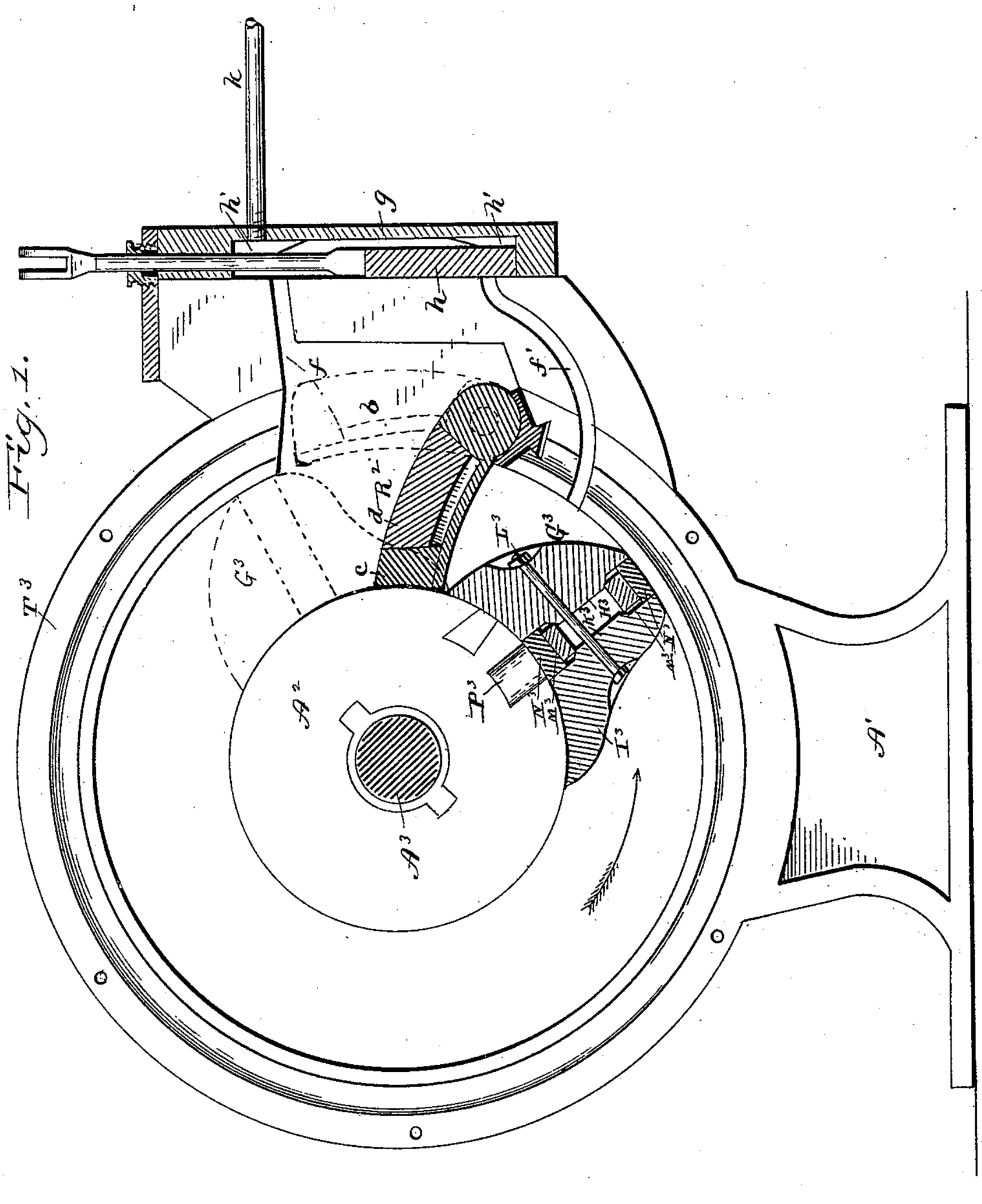
(No Model.) 3 Sheets—Sheet 1.

B. F. WRIGHT.

ROTARY ENGINE.

No. 426,976. Patented Apr. 29, 1890.



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(No Model.) 3 Sheets—Sheet 2.

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ROTARY ENGINE.

No. 426,976. Patented Apr. 29, 1890.

Fig. 2.

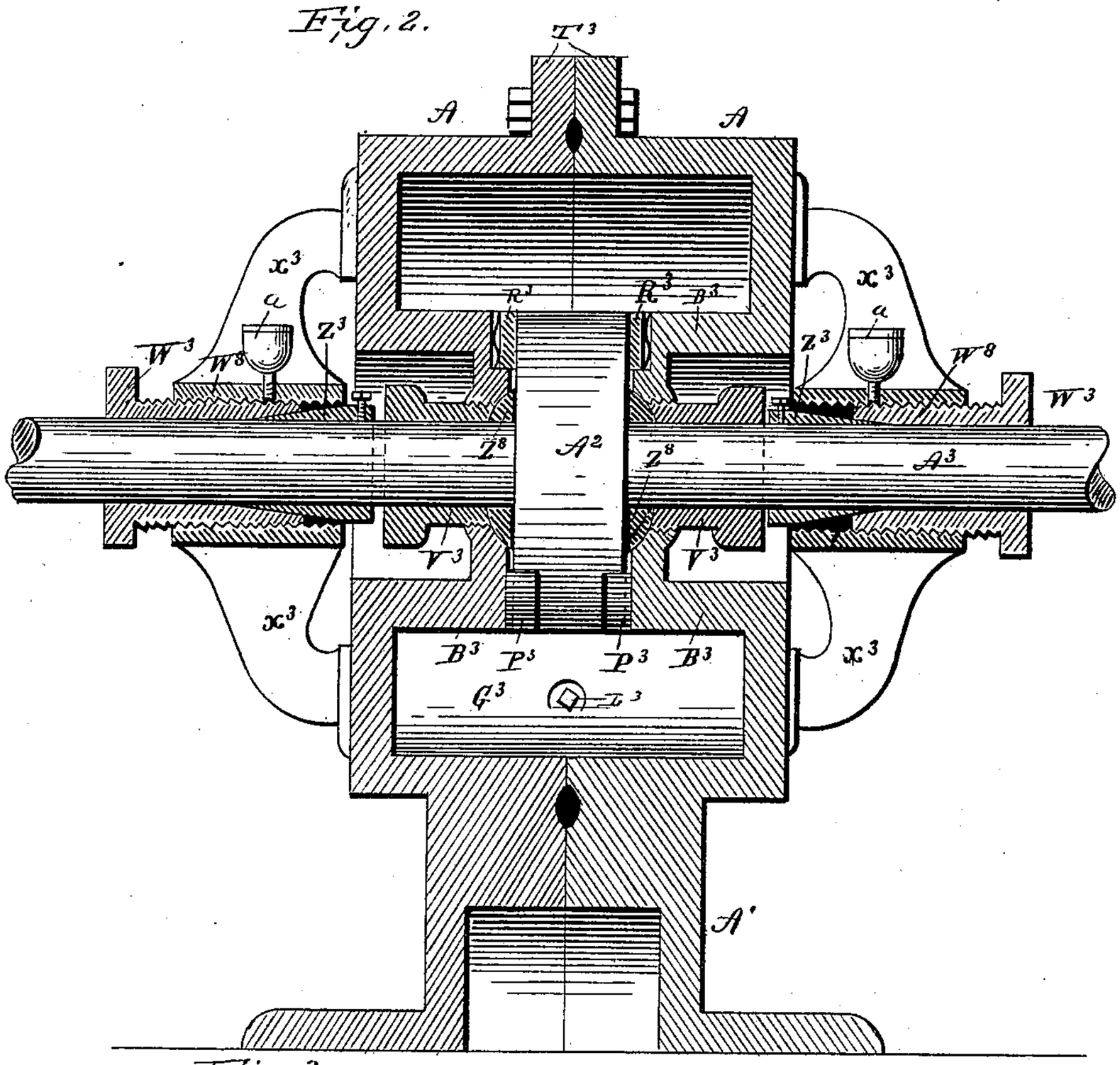


Fig. 3.

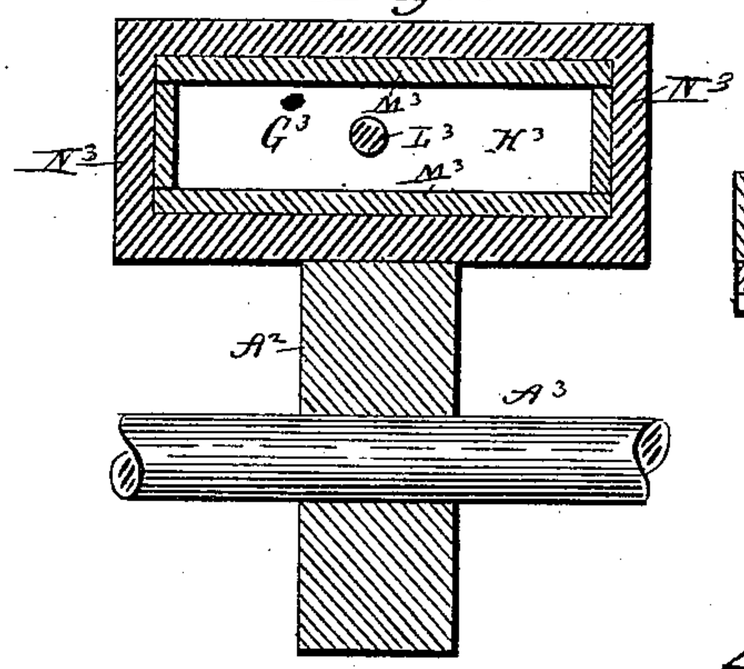


Fig. 4.

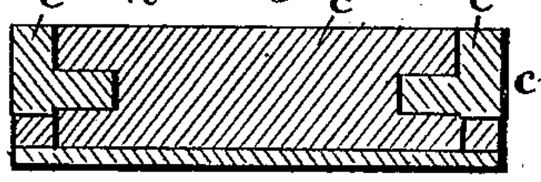


Fig. 5.

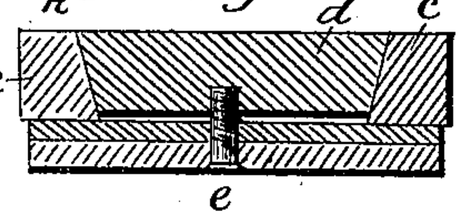
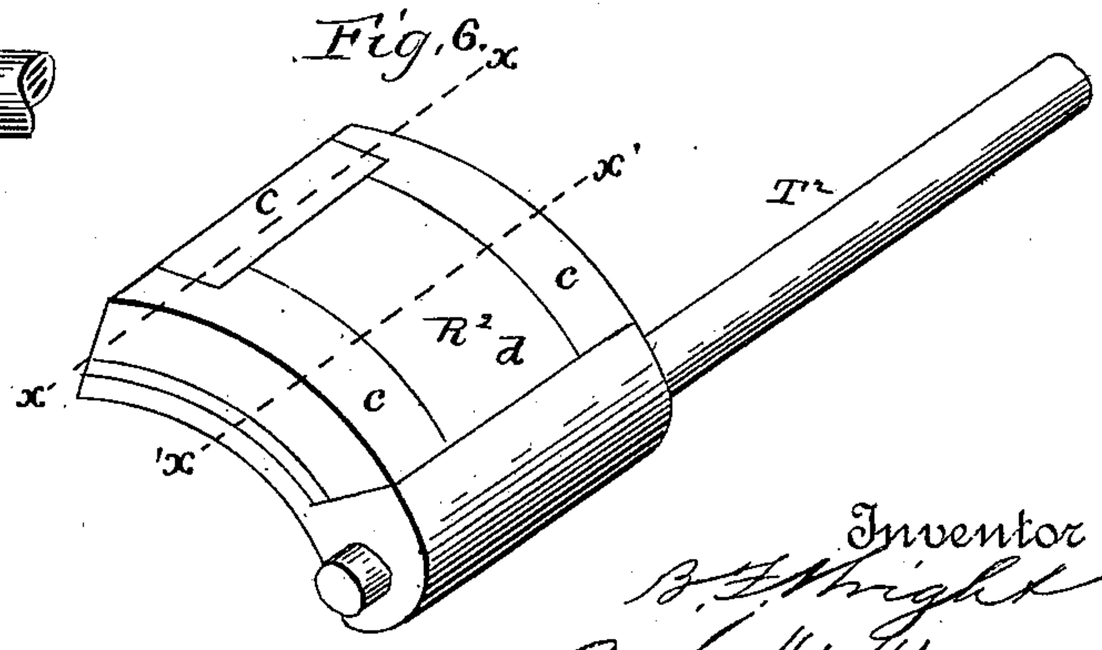


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

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ROTARY ENGINE.

No. 426,976. Patented Apr. 29, 1890.

Fig. 7.

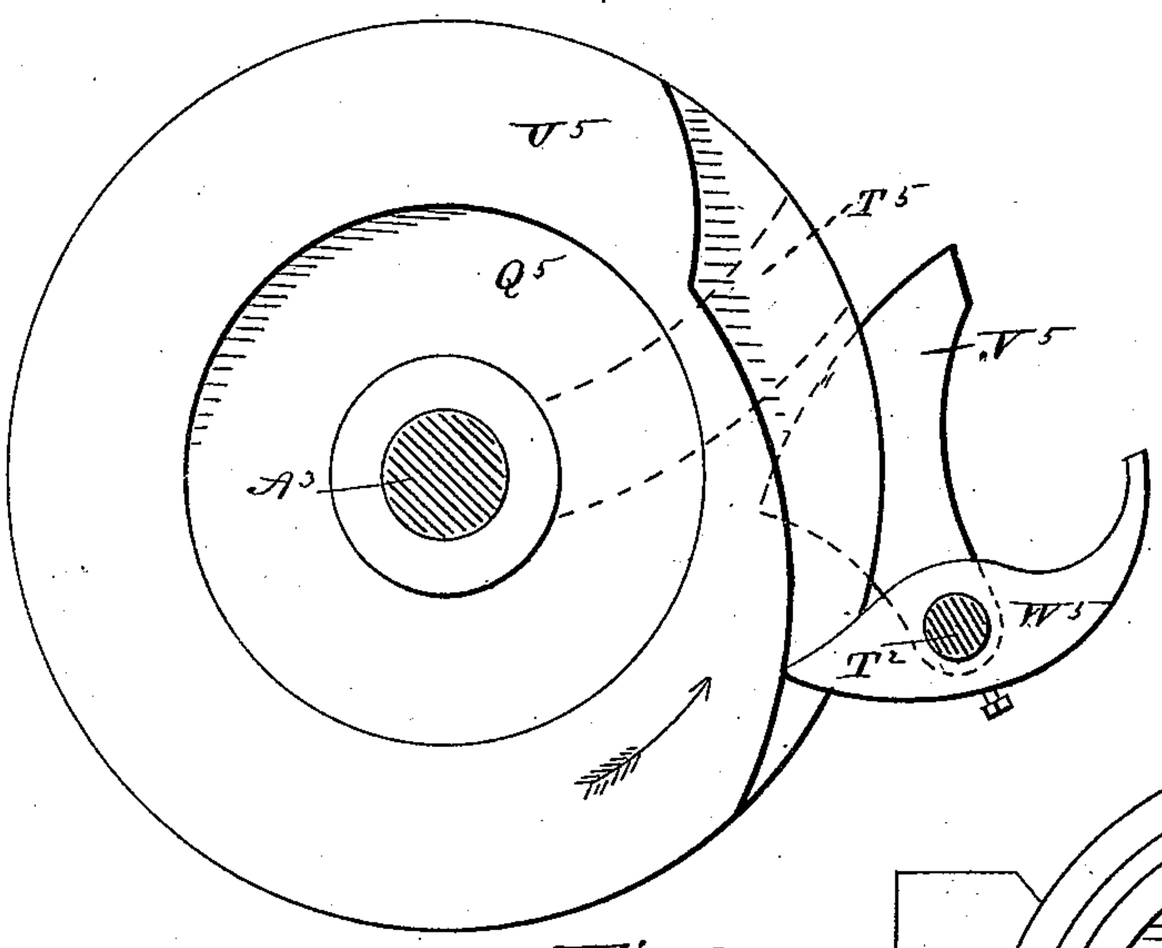


Fig. 8.

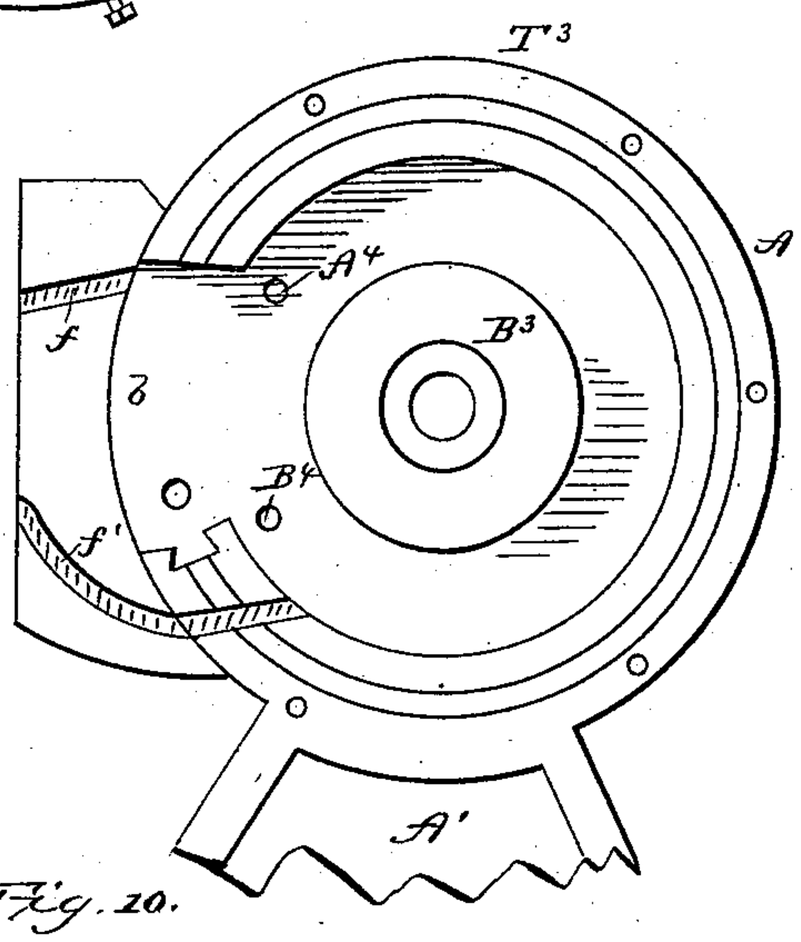


Fig. 9.

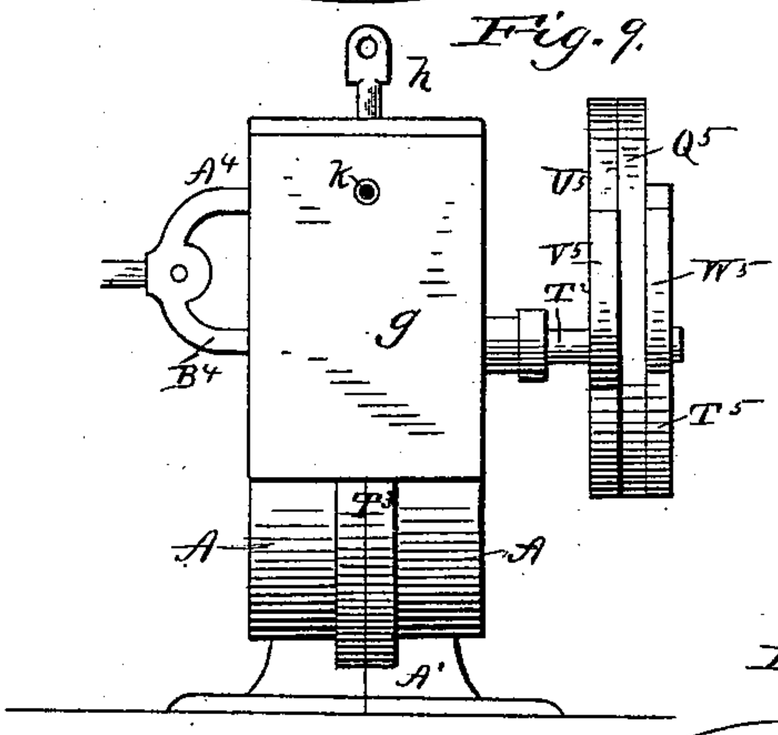
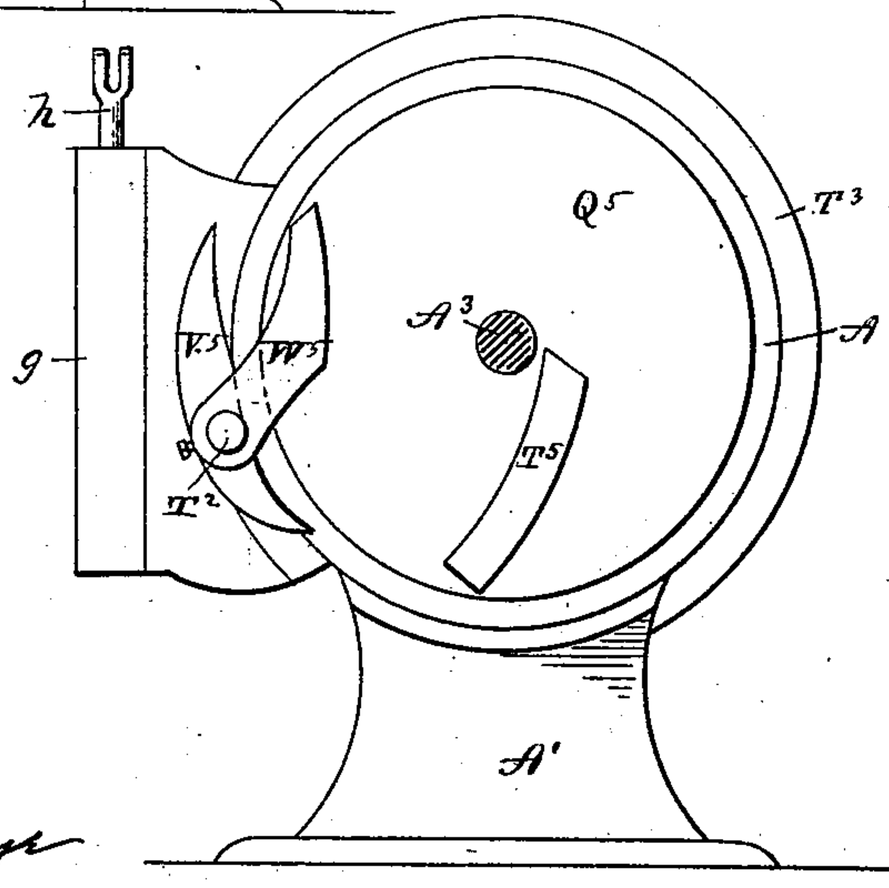


Fig. 10.



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Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN F. WRIGHT, OF LOVINGTON, VIRGINIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 426,976, dated April 29, 1890.

Application filed August 5, 1889. Serial No. 319,734. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. WRIGHT, a citizen of the United States, residing at Lovington, in the county of Nelson and State of Virginia, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a vertical sectional view of my improved rotary engine complete; Fig. 2, a vertical longitudinal sectional view; Fig. 3, a detail sectional view of the rotary piston; Fig. 4, a longitudinal sectional view of the valve on the line $x\,x$ of Fig. 6; Fig. 5, a similar view on the line $x'\,x'$ of Fig. 6; Fig. 6, a perspective view of the valve; Fig. 7, a detail view of the cams and arms for operating the oscillating valve; Fig. 8, an end elevation of the interior of one of the cylinder or engine shells opposite to that shown in Fig. 1; Fig. 9, a side elevation of the engine, and Fig. 10 an end elevation of the same.

The invention has for its objects, essentially, to produce an efficient and practical rotary motor or engine to be used particularly with the compressed-air motor patented to me on the 13th day of August, 1889, (numbered 408,784,) as will more fully hereinafter appear. Although this engine is particularly designed for use in connection with my former patent, and is shown and described in detail therein, I desire it understood that I do not limit myself in this respect, inasmuch as this rotary engine may be run by any suitable motive fluid, such as steam, gas, &c.

In the drawings annexed the motor casing or shell is constructed of two similarly-constructed sections A A, which are provided with suitable peripheral flanges T^3, by means of which and suitable bolts the said sections are securely fastened together. The casing is cast integral with or bolted to a suitable base or standard A′. The adjacent faces of the flanges T^3 are provided with annular packing recesses or grooves, in which a suitable packing material is confined. The sections A of the casing are each provided with an inwardly-projecting centrally-located boss or shell B^3, provided with a central opening for the passage of the drive-shaft A^3. Secured rigidly to the drive-shaft and adapted to revolve between the faces of the shells B^3 is a disk A^2. The shaft A^3 has its bearings in glands V^3, which are screw-threaded externally at one end, whereby they may be tapped into the central openings in the stationary shells B^3. These glands also serve to keep the packing Z^8 pressed closely around the drive-shaft and against the rotary disk A^2. The shaft A^3 also passes through and has its bearings in externally-screw-threaded glands W^3, which are screwed in internally-threaded tubular supports W^8, secured to the opposite sides of the engine-casing by means of bracket-arms x^3, as shown in Fig. 2. The inner ends of these last-mentioned glands are reamed out to form beveled seats or bearings for the conical thimbles Z^3, which surround the shaft and are secured thereto by means of suitable set-screws. By means of this arrangement the wear may be taken up from time to time, and thereby preserve the efficiency of the shaft-bearings. Suitable oil-cups a are screwed into the tubular supports W^8.

The rotating disk A^2 is provided with recesses upon opposite sides, which are fitted with spring-actuated packing-plates P^8, rounded or beveled on the outside, as shown in Fig. 1. The faces of the bosses B^3 are also provided with similar spring-actuated packing-plates R^3, as shown in Fig. 2. The disk A^2, at a suitable point on its periphery, has secured to it a piston-section G^3, which fits closely between the interior walls of the casing and bosses B^3. This section G^3 is curved or rounded on one face, and its opposite face is provided with a central beveled abutment H^3. I^3 indicates a similar section provided with a similar abutment K^3, the two sections being adjustably secured together by a threaded bolt L^3 and nuts, the nuts setting in suitable recesses in the outer curved faces of the sections. Between the sections, and resting upon the beveled edges of the abutments thereof, are arranged packing-plates M^3, provided with beveled edges bearing against the beveled edges of the abutments, so as to be pressed outwardly thereby as the sections are brought together by the bolt L^3, whereby the packing N^8 is distended and the piston effectually packed.

Pivoted in an opening b in one side of the

casing is an oscillating valve R^2, the shaft of which passes through a suitable stuffing-box to the outside of the casing, and is arranged parallel with the main shaft. This valve, when turned down, extends across the line of travel of the piston and fits closely against the interior of the engine-casing and the periphery of rotary disk A^2 and the bosses B^3, and when turned up to allow the piston to pass it sets back in the opening *b*, with its inner curved face flush with the interior wall of the engine-casing, as shown by dotted lines in Fig. 1.

Located below the valve R^2, and bearing against its lower rounded portion, is a suitable packing-block, of copper or other suitable material, which is kept yieldingly pressed against the rounded portion of the valve and prevents leakage of the motive fluid. This valve is constructed, as shown in detail in Figs. 4, 5, and 6 of the drawings, with packing-sections *c*, of copper or other suitable material, which set upon the convex face of the valve and bear against the outer beveled edges of an intervening block *d*, adjustably secured to the valve by a screw *e*. The packing-strips are pressed outwardly against their respective bearing-surfaces by means of the screw and beveled block *d*, as is evident.

The inlet-ports *f f'* enter the engine-casing at suitable points above and below the valve R^2, and connect the interior of the casing with the interior of a suitable valve-chest *g*, bolted to the said casing over the ports. Within this valve-chest is arranged a vertically-working reversing-valve *h*, which may be operated to alternately open and close the inlet-ports *f f'*. This valve is kept pressed to its seat over either one of the ports by means of inclined or beveled ribs *h'* upon the interior of the valve-chest, as shown in Fig. 1. The motive fluid is conducted to the valve-chest by means of a pipe *k*.

The letters A^4 and B^4 designate the exhaust-ports leading out from the interior of the casing above and below the valve R^2, these ports being suitably valved.

Secured upon the drive-shaft A^3, outside of the casing, is a disk Q^5, having upon its opposite sides the cams U^5 T^5, which actuate cam-arms V^5 and W^5, secured to the valve-stem T^2 of the valve R^2, to actuate the same when the engine is reversed. These cams remain idle while the engine is running forward in the direction indicated by the arrow in Fig. 1; but when reversed the valve R^2 is raised by means of cam T^5 and cam-arm V^5, and after the piston has passed the valve the cam U^5 operates the arm W^5 to throw the valve R^2 back into its normal position.

The operation of the engine will be apparent from the foregoing. In starting the engine the piston and valve are placed in the relative positions shown in dotted lines in Fig. 1. The entering fluid will not only serve to force the piston around, but will also press the valve tightly to its seat. When the valve is first forced inwardly by the influx of steam, it will press against the concaved face of the piston and assist the steam in forcing the same around.

The motive fluid is preferably admitted and regulated by means of the automatic cut-off device (shown in my former patent) hereinbefore mentioned; but it is evident that I may use any other suitable device.

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

1. The combination of the valve R^2, the expansible beveled packings attached thereto, the interposed beveled expanding block, and the adjusting screw, as described.

2. The combination of a casing, a shaft provided with a rotary piston, an oscillating valve pivoted in an opening in said casing, independent exhaust and inlet ports entering the said casing above and below said oscillating valve, a valve-chest secured over the inlet-ports, this chest being provided with inclined wings upon its interior, and a reversing-valve working against said wings and adapted to alternately open and close the said inlet-ports, as and for the purpose described.

3. The combination of a casing, a drive-shaft provided with a rotary piston, an oscillating valve in said casing, cam-arms W^5 V^5, secured upon the shaft of said valve, and cams upon the drive-shaft adapted to actuate the said valve-shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN F. WRIGHT.

Witnesses:
J. S. PEACH,
AARON HARTER.