No. 753,790. PATENTED MAR. 1, 1904.

A. F. FORD.

ROTARY ENGINE.

APPLICATION FILED SEPT. 19, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

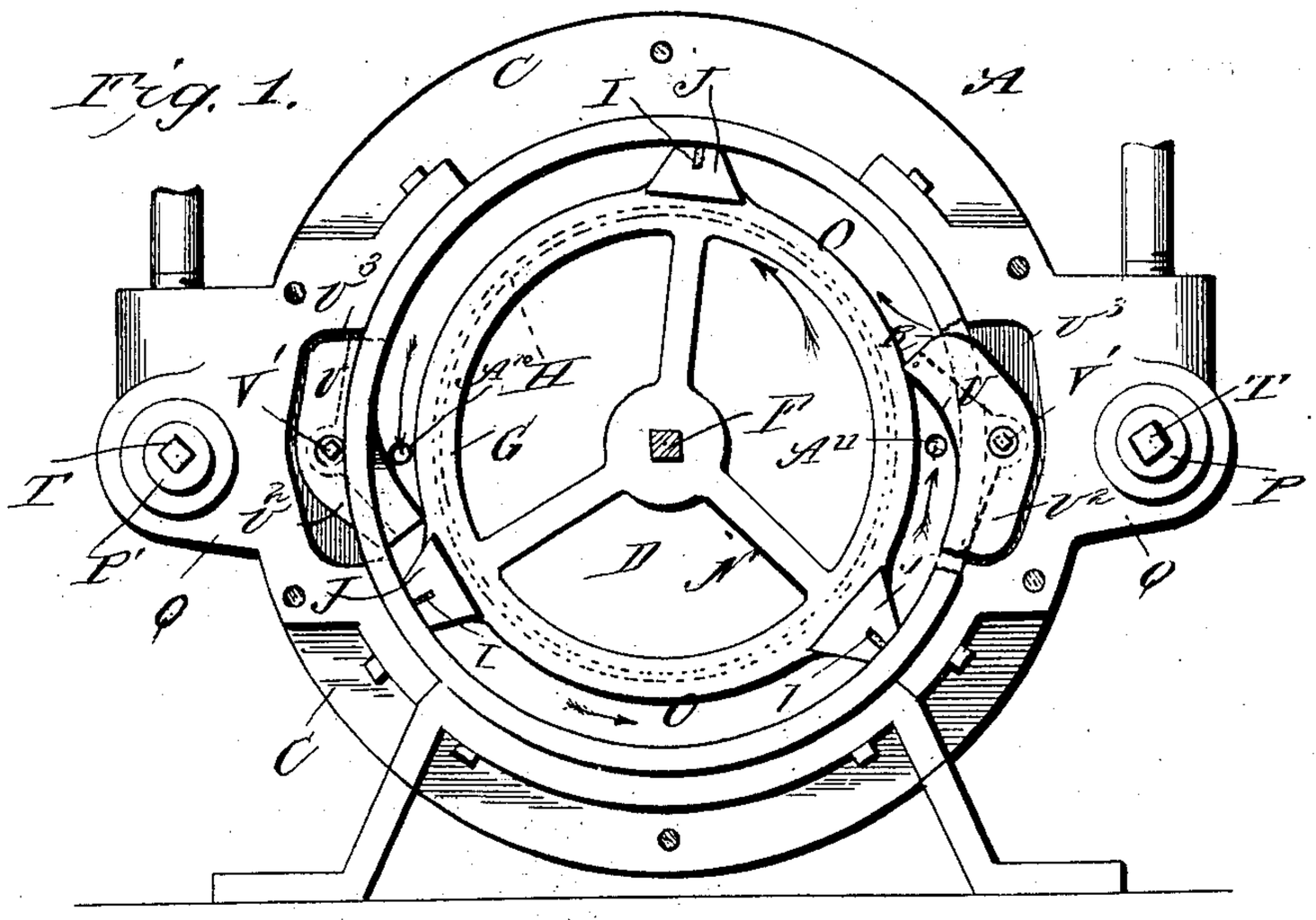
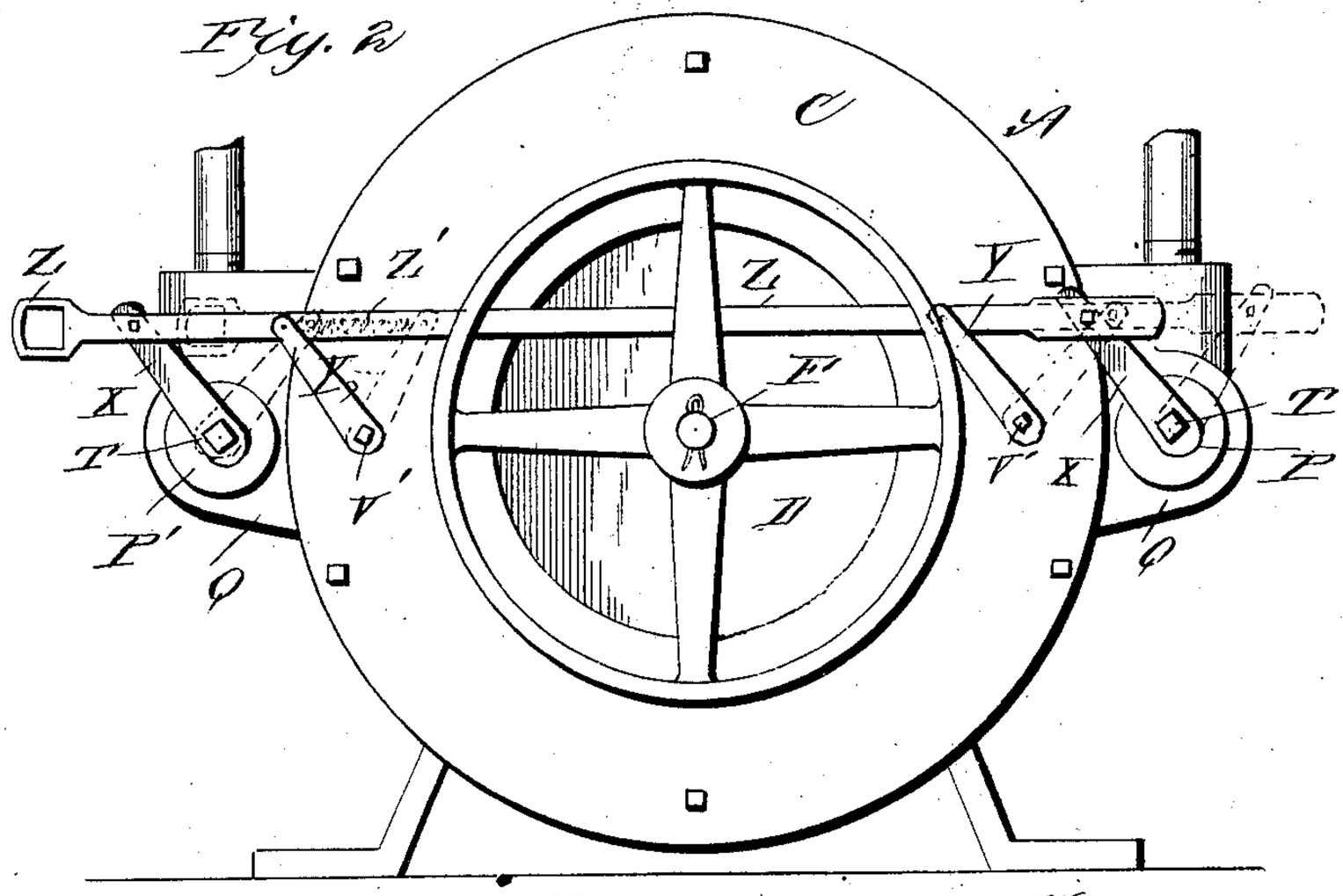


Fig. 2.



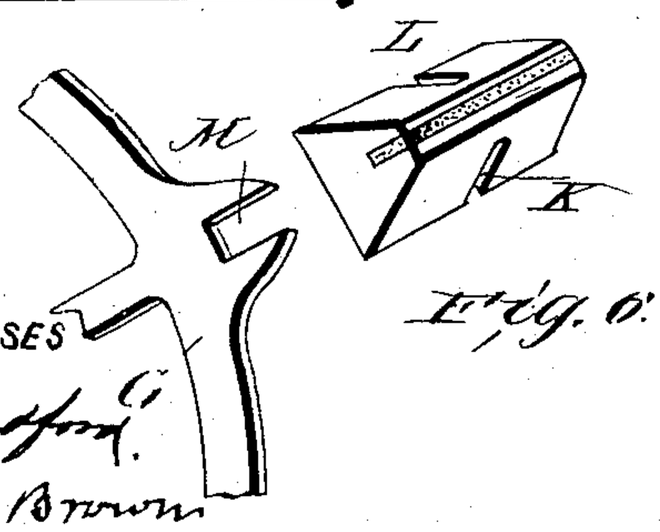


Fig. 6.

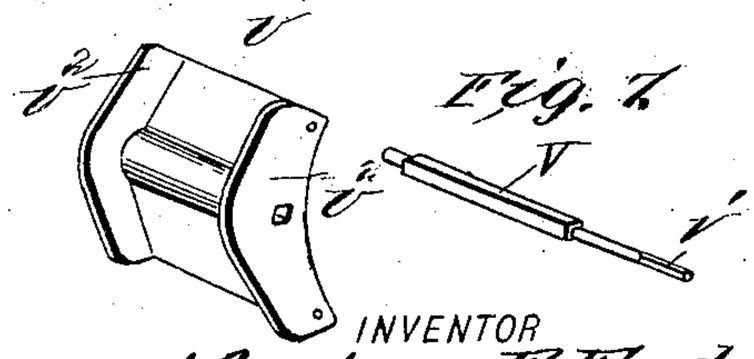


Fig. 7.

WITNESSES

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ROTARY ENGINE.

APPLICATION FILED SEPT. 19, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

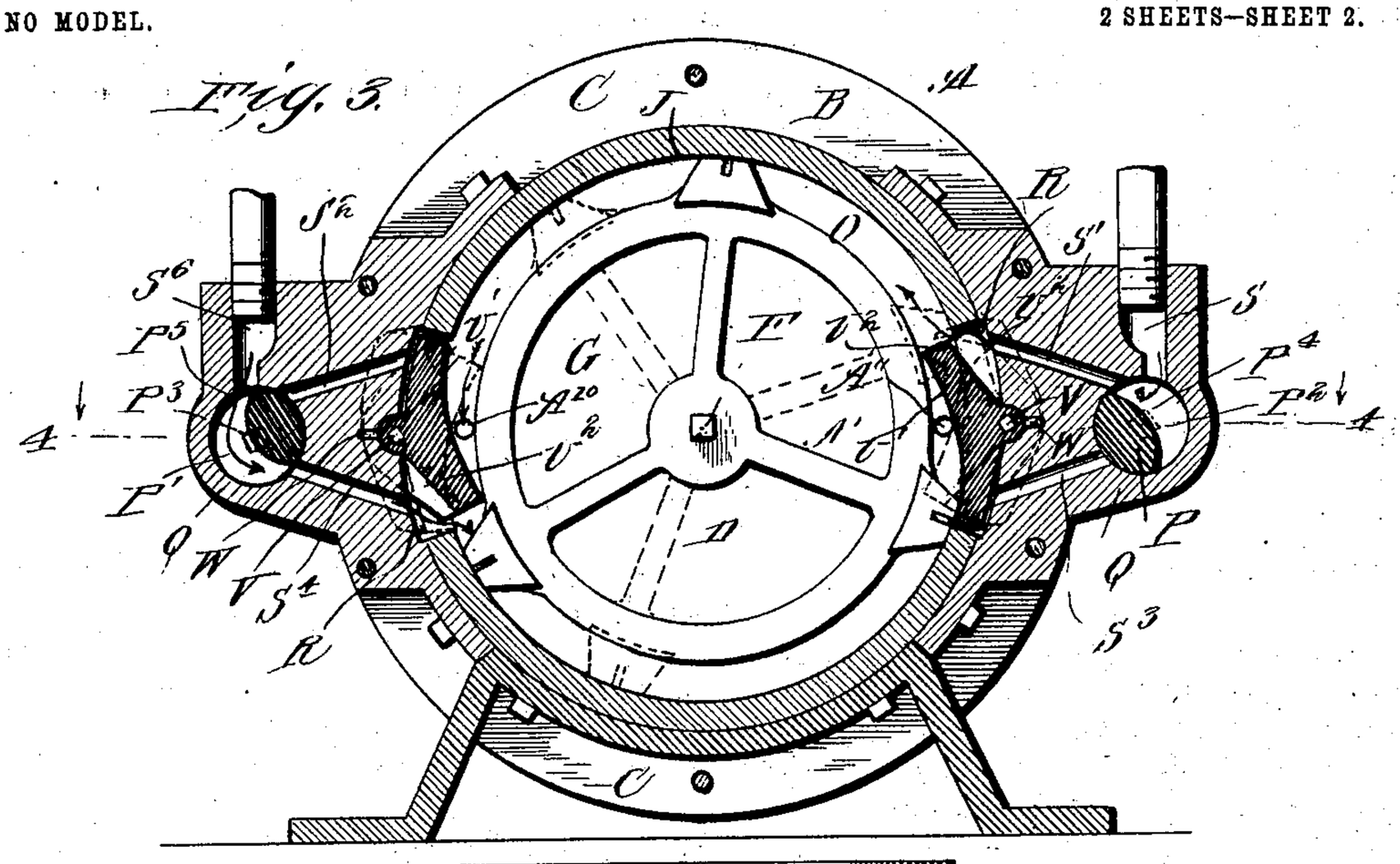

Fig. 4

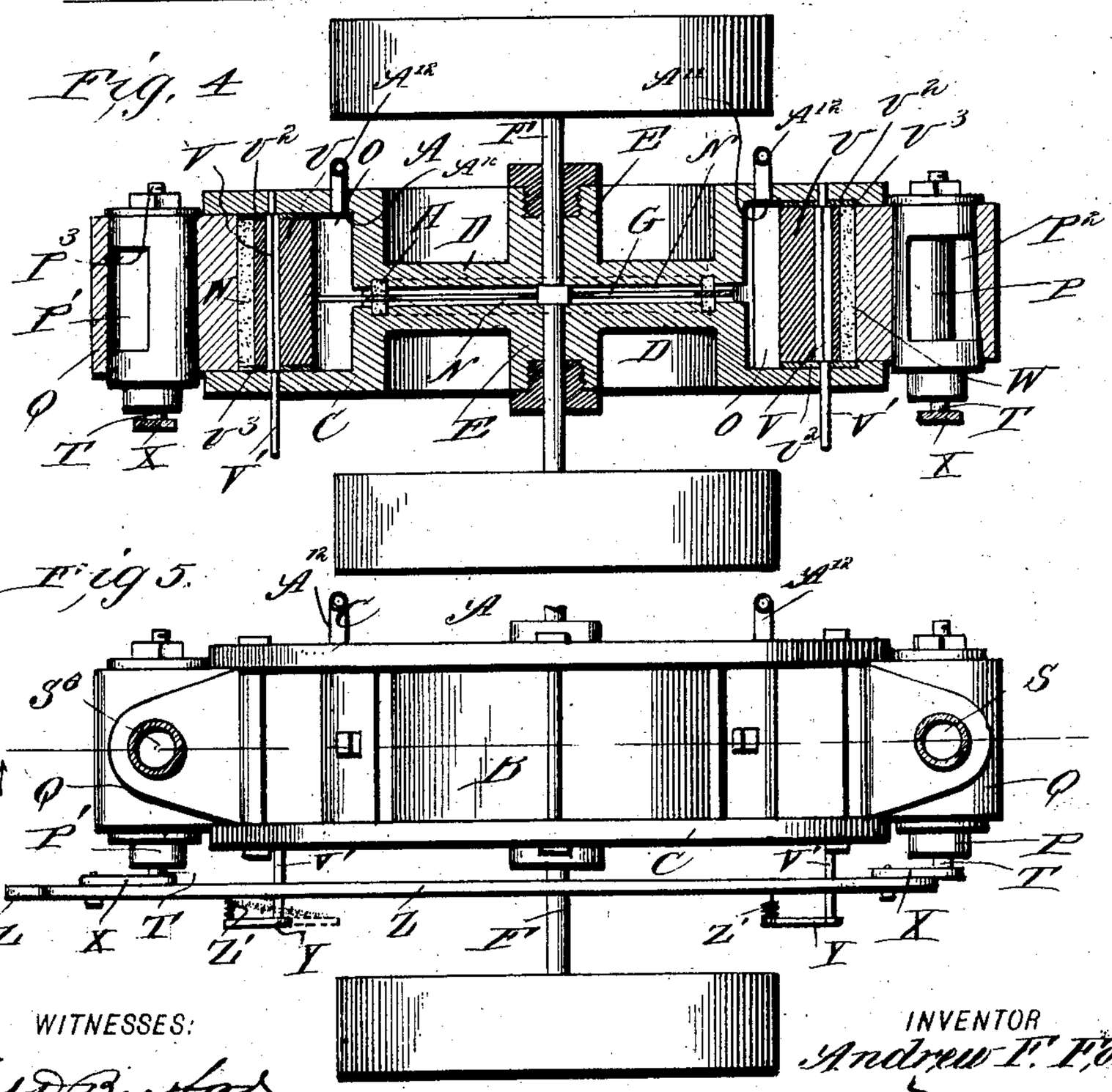

Fig. 5.

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UNITED STATES PATENT OFFICE.

ANDREW FRANCIS FORD, OF COLFAX, WASHINGTON, ASSIGNOR OF ONE-HALF TO WILLIAM SCHLUTING, OF COLFAX, WASHINGTON.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 753,790, dated March 1, 1904.

Application filed September 19, 1903. Serial No. 173,879. (No model.)

To all whom it may concern:

Be it known that I, ANDREW FRANCIS FORD, a citizen of the United States, and a resident of Colfax, in the county of Whitman and State of Washington, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to rotary engines.

The invention consists of the special construction and arrangement of parts, which will hereinafter be fully described with reference to the accompanying drawings, and the novel features pointed out in the claims.

In the drawings, Figure 1 is a view in side elevation with one side of the casing removed. Fig. 2 is a side elevation illustrating my invention. Fig. 3 is a longitudinal vertical sectional view on line 3 3 of Fig. 5. Fig. 4 is a horizontal sectional view on line 4 4 of Fig. 3. Fig. 5 is a top plan view. Fig. 6 is a perspective view showing a section of the piston-wheel with the piston removed, and Fig. 7 is a perspective view showing one abutment and its shaft in detached position.

In the preferred embodiment of my invention I employ, briefly stated, a suitable casing or cylinder, in which is arranged a disk-like wheel carrying suitable buckets or pistons and peculiar shifting abutments, the cylinder or casing being provided with opposite rotatable valves, ports adapted to feed and exhaust, and mechanism whereby the rotatable valves and shifting abutments may be worked, which I will describe in detail, as follows:

Referring to the drawings, A denotes the cylinder or casing, consisting of an annular portion B and side plates C. The side plates C are constructed with depressed centers D and projecting hubs E, through which latter the power-shaft F extends, as will be understood. It will be noticed that the depressed centers D of the side plates C are arranged on the shaft F, suitably spaced from a disk-like wheel G, which is fixed to the shaft F. Packing-rings H are provided at opposite sides of the wheel G, as will be understood. On the periphery of the disk-like wheel G, I arrange three elongated equidistant laterally-disposed pistons I, having suitable packing-plates J. The pistons are recessed on their under side, as at K, leaving a web L, adapted to receive the bifurcated projection M on the wheel G. In carrying out my invention a space N is formed in the cylinder or casing adapted for proper reception of the wheel G. An enlarged space O (the steam-space) is also provided for the reception of the pistons I.

P P′ denote rotatable or oscillating valves recessed at P^2 P^3, forming spaces P^4 P^5. The valves P P′ are arranged in boxes Q, which are secured to opposite outer sides of the annular portion B, covering openings R therein, as shown. The boxes Q have steam passageways S S^6 and ports S′, S^2, S^3, and S^4, leading into the steam-space O of the cylinder through the openings R in the annular portion B, as shown in Fig. 1. It will be understood that steam enters the engine through both passageways S S^6 to the respective feed-ports. Suitable exhaust-ports are provided at A^{10} and A^{11} in the rear side plate, (see Figs. 1, 3, and 4,) which will be understood. The valves P P′ have projecting stems T T for the purpose as will appear farther on.

U U′ denote yielding abutments fixed to transverse shafts V, having projecting stems V′. Suitable packing is provided at W between the abutment-shafts V and the inner sides of the boxes Q. It will be noticed that the abutments U U′ are arranged and work in the openings R in the annular portion B and that they have side wings or flanges U^2, which work in recesses U^3, adapted therefor in the boxes Q.

According to my invention crank-arms X are arranged on the projecting stems T of the valves P P′, and similar crank-arms Y are arranged on the projecting stems V′ of the abutment-shafts V. It will be noticed that the valve crank-arms X have fixed pivotal connection to the shifter-arm Z and that the abutment crank-arms Y are secured to the shifter-arm Z by means of a yielding or spring connection Z′.

The operation of my improved rotary engine as above described will be fully understood. In Fig. 1 the valves P P′ are set, the former for feeding into the steam-space O and through the ports S′ and S⁴, driving the engine as indicated by the arrows. The abutments being yieldingly connected to the shifter-arm Z, as hereinbefore described, obviously as a piston I passes thereby they will be forced to rock in direction with the engine rotation to an adjusted position. (See Figs. 1 and 3.) It will be further understood that both abutments will be yieldingly held according to the adjustment of the valves P P′. In Figs. 1 and 3 they are shown set for feeding steam through ports S′ and S⁴, driving the piston-wheel in direction of the arrow. When it is desired to reverse rotation of the piston-wheel, the shifter-arm is adjusted to the dotted position (see Fig. 2) and whereby the valves P P′ are set for feeding steam through the ports S² and S³, effecting pressure on the abutments, as will be understood.

In further description of my invention it may be well to say that the abutments U U′ are yieldingly held set adapted to be tilted by the pistons J, as indicated by dotted lines, according to the forward or reverse rotation of the piston-wheel.

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

1. The combination in a rotary engine, of a suitable casing, a valve-box on opposite sides of the casing; having separate feed-ports, exhaust-ports in the casing, an oscillating valve in each said box, oscillating abutments in the engine-casing, a shifter-arm having fixed crank connection to the said oscillating valves and similar but yielding connection to the said oscillating abutments, and a rotatable wheel having pistons adapted in operation to work the said oscillating valves, substantially as described.

2. The combination with a rotary engine of the character described, employing a casing, and a rotatable wheel having suitable pistons, of opposite boxes having separate feed-ports, exhaust-ports in the casing, rotatable valves in the said boxes; adapted to be set for reversing the engine, yielding oscillating abutments adapted, during passage thereby of the said pistons, for closing the feeding-port, and a shifter-arm having suitable connection to the said rotatable valve and oscillating abutments, substantially as described.

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Witnesses:
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