

**No. 711,261.**

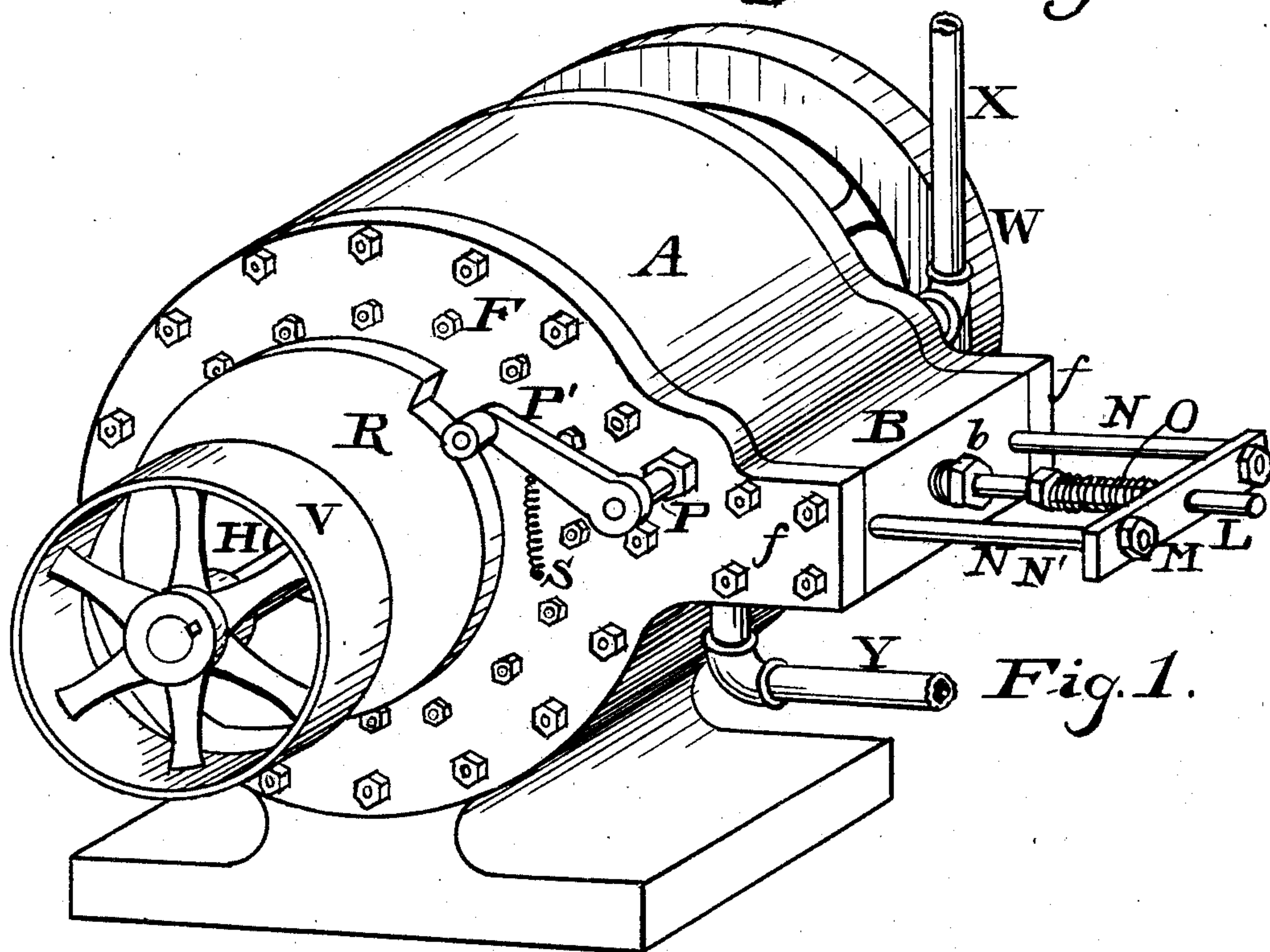
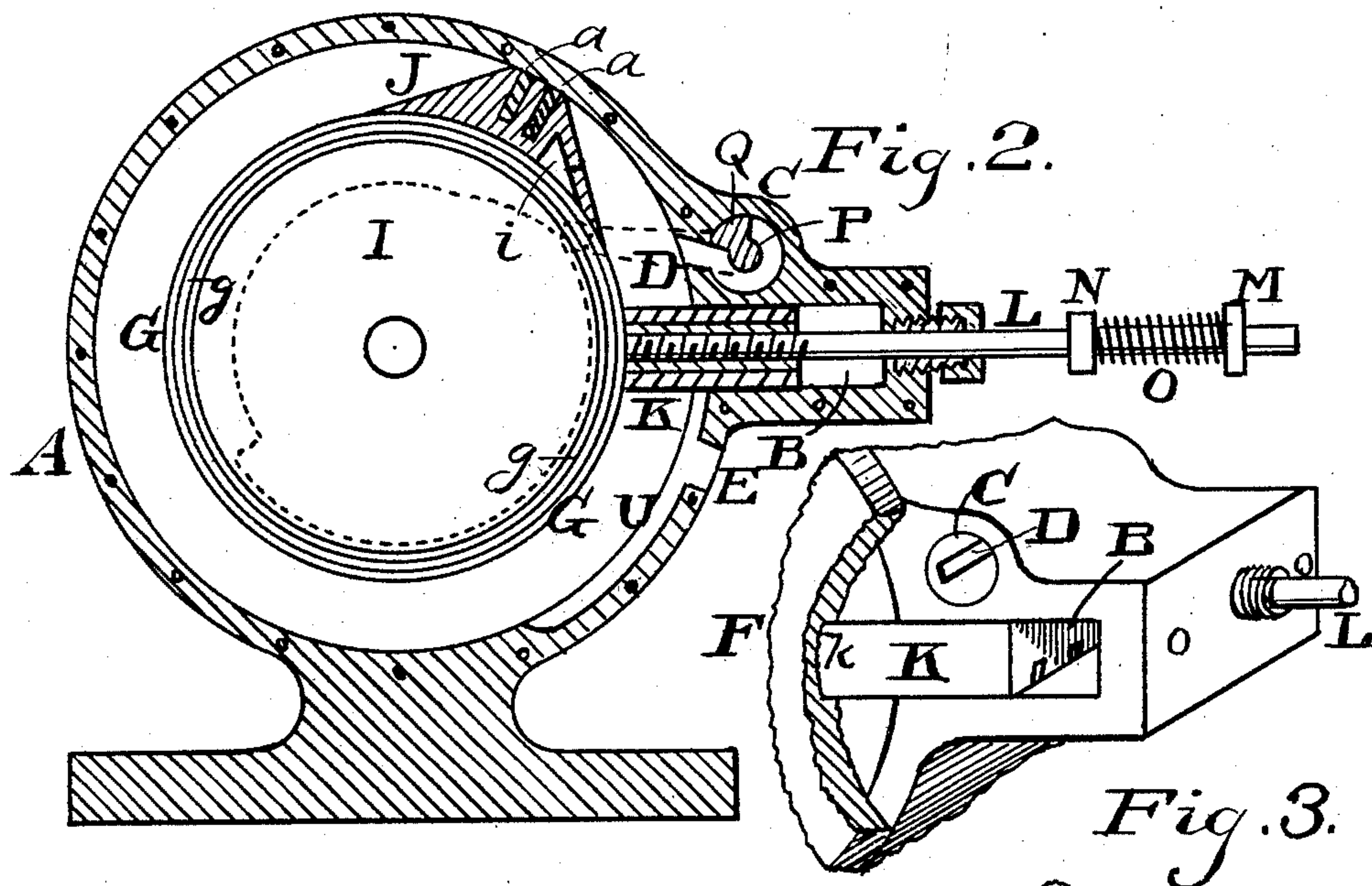
Patented Oct. 14, 1902.

V. A. RICE.  
ROTARY ENGINE.

(Application filed Feb. 24, 1902.)

(No Model.)

**2 Sheets—Sheet 1.**



Witnesses:

Henry Timmon  
Edward F. Spurney

*Inventor:*

Victor A. Rice,  
per Geo. W. Tibbitts,  
Attorney.

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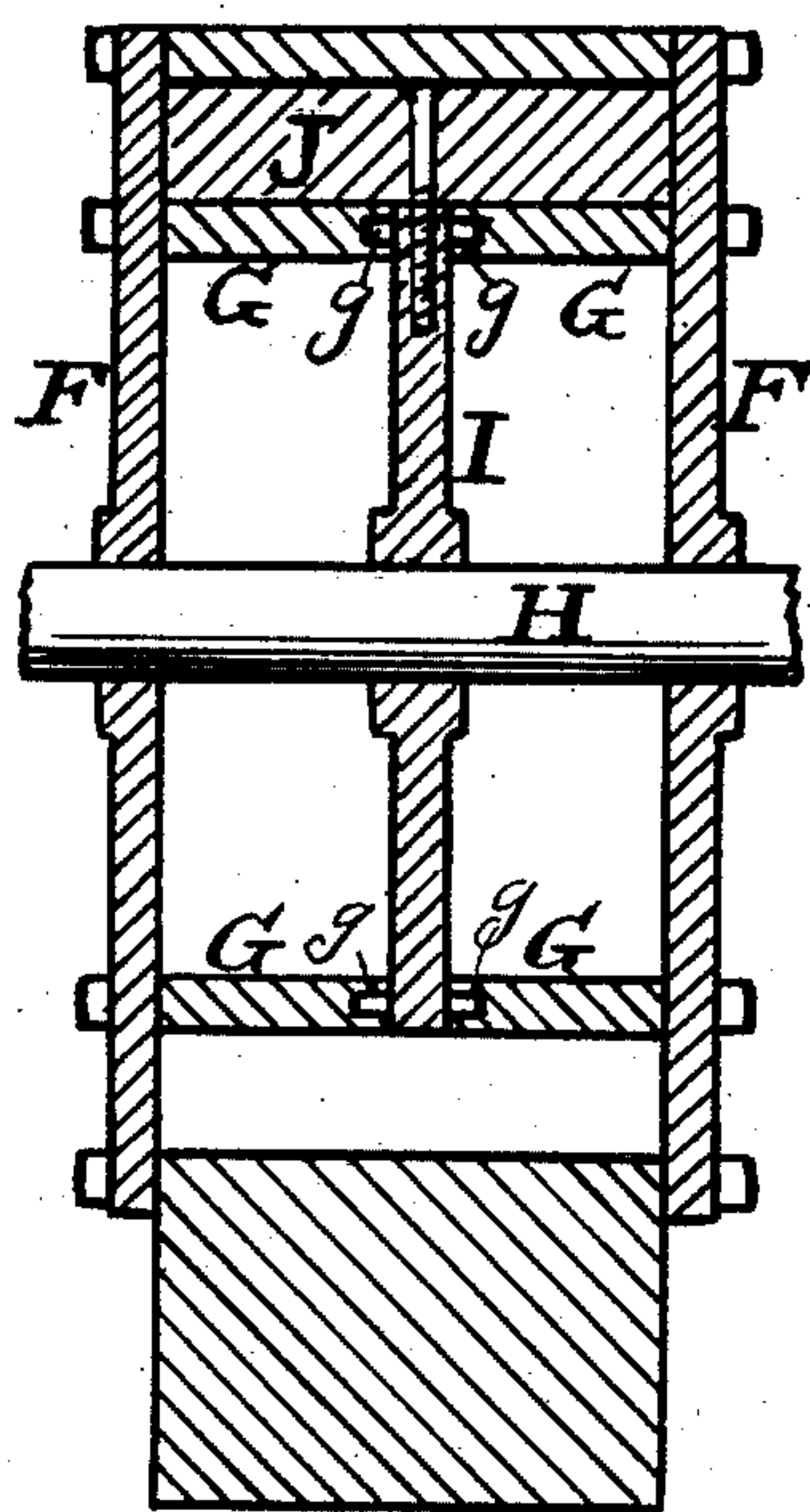


Fig. 6.

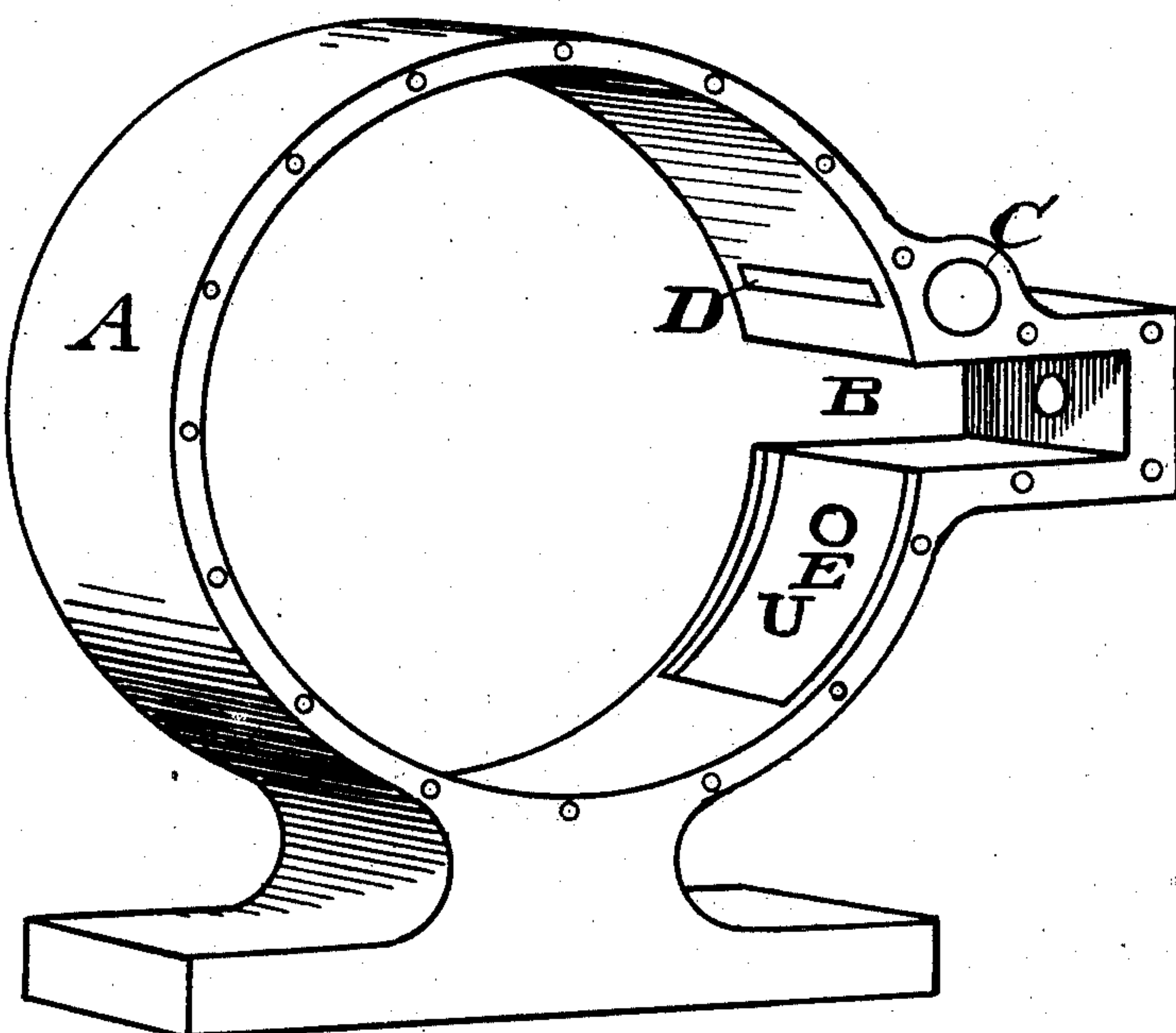


Fig. 5.

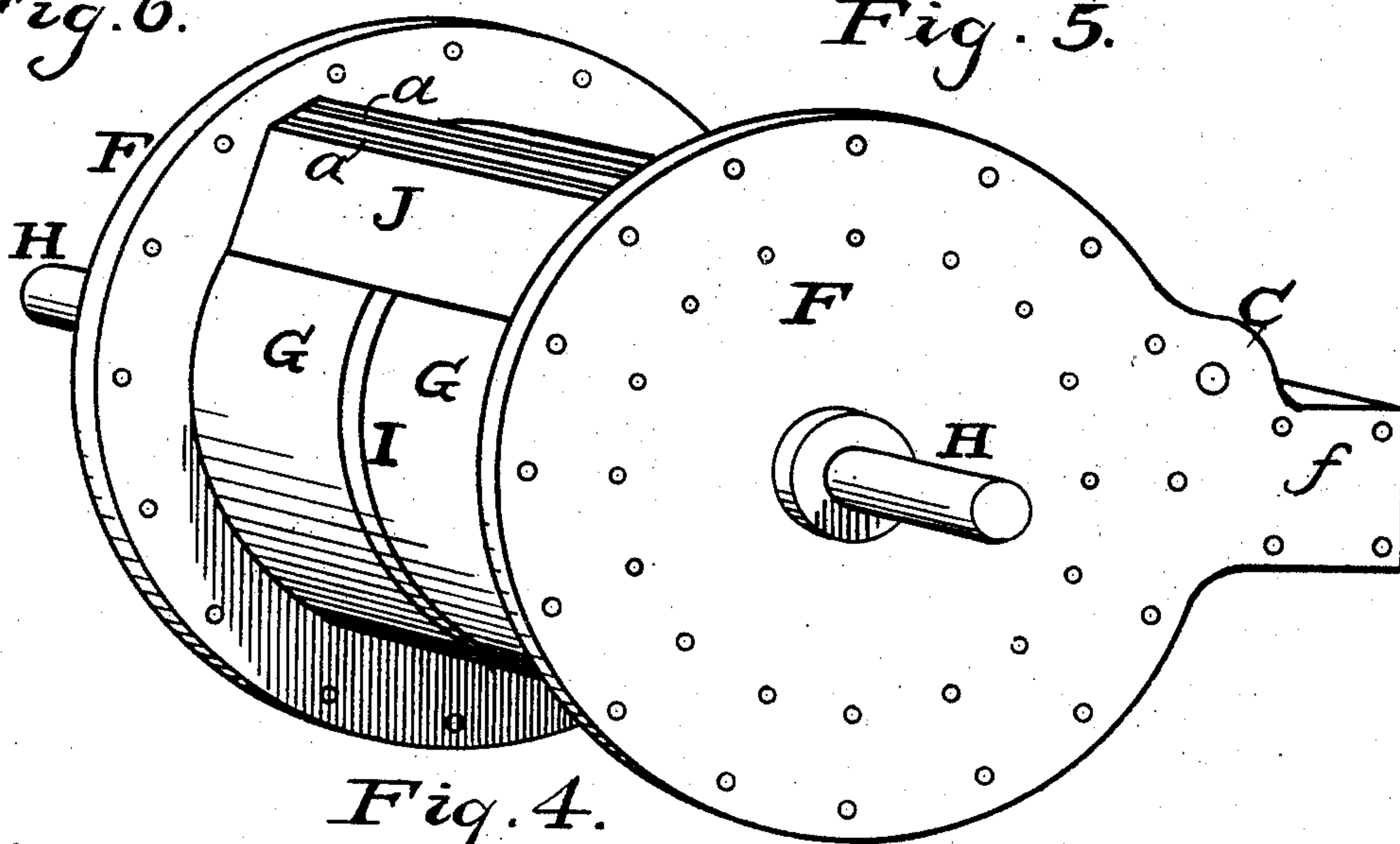


Fig. 4.

Witnesses:

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Edward F. Spurney

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# UNITED STATES PATENT OFFICE.

VICTOR A. RICE, OF ELYRIA, OHIO.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 711,261, dated October 14, 1902.

Application filed February 24, 1902. Serial No. 95,197. (No model.)

*To all whom it may concern:*

Be it known that I, VICTOR A. RICE, a citizen of the United States of America, and a resident of Elyria, county of Lorain, and State of Ohio, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to rotary engines, and has for its object the production of an engine of its class that shall be simple, speedy, and economical in its construction and its movements.

The invention consists in the new constructions and combinations of the mechanism constituting such a motor, substantially as hereinafter described, and pointed out in the claim.

In the accompanying drawings, Sheet 1, Figure 1 is a perspective view of my new rotary engine as seen complete and ready for operation. Fig. 2 is a vertical section through the center, showing the piston, the valve, and the self-operating abutment. Fig. 3 is a perspective view of a portion of the cylinder and the valve and abutment, showing the seat of the abutment in the cylinder and cylinder-heads. Sheet 2: Fig. 4 is a perspective view of the cylinder-heads, the inner cylinder, the piston, and piston-supporting disk. Fig. 5 is a detached perspective view of the cylinder and the valve and abutment seats. Fig. 6 is a vertical section through the cylinders, cylinder-heads, the piston, and piston-supporting disk transverse to Fig. 2.

A, Figs. 1, 2, 5, 6, represents the cylinder of the engine. B is the sliding abutment-chamber formed on one side of said cylinder, and C is the valve-chamber located just above said chamber B.

D is the steam-inlet port leading from the valve-chamber into the cylinder, and E is the exhaust-port just beneath said chamber B.

F F are the cylinder-heads, having extensions *ff*, which inclose the ends of the chambers B and C.

G G represent an inner cylinder made in two parts and secured to the heads F F in like manner to the outer cylinder, thus providing an annular piston-chamber between the two cylinders.

H is a shaft supported in the center of the heads F F. I is a disk on said shaft and ro-

tating in the central space between the two parts of the inner cylinder G G, and J is a rotary piston attached to and carries said disk in its movements. The piston consists of a triangular-shaped block having its broad bearing upon the surface of the inner cylinder G G, the outer and narrow side bearing against the inside surface of the outer cylinder A. The outer narrow side of the piston is provided with packing-strips *a a*, held in grooves in said outer side. The inner edges of the cylinder G G are also provided with packing-strips *g g*, held in annular grooves in the said edges. The piston also has a chamber *i* in its under side with a small hole or holes through the upper side for the admission of steam to balance the pressure on said valve.

K is a sliding abutment-head playing in the chamber B and consists of a block closely fitted in the chamber, having its ends sliding in grooves *k* in the heads F F. (Seen in Fig. 3.) The upper and lower sides of the block K are provided with packing-strips. L is a rod attached to said block K, extending out through the end wall of the chamber B and packing-box *b* and on through the cross-bar M on the frame N.

O is a spring on the rod L, bearing against the bar M and a nut N' on said rod. This spring serves to force the abutment inward after the piston has passed by it and forced it outward and into the chamber B.

The valve consists of a shaft P, journaled in the heads F F.

Q is a side projection on the shaft P, which closes the port D and opens the port in its movements.

R is a cam-wheel on the main shaft H for operating the valve. P' is a crank on the end of valve-shaft P, operated by the said cam R.

S is a spring connected with the crank P' for holding it down onto the cam.

E is the exhaust-port leading out of a shallow expansion-chamber U in the cylinder A.

V is a pulley on the shaft H, and W is a balance-wheel also on said shaft H.

X is the steam-inlet pipe, and Y is the exhaust-pipe.

The operation of this construction for a rotary engine will be seen to be very simple, speedy, and economical by the following de-

scription of the movements: The steam entering the port at C forces the piston J in its rotary movement, and the cam R cuts off the steam by closing said port at such point as the cam  
5 may be adjusted to. Then the expansive power of the steam finishes the revolution. The chamber U gives easy and ready exhaustion of the spent steam.

Having described my invention, what I  
10 claim is—

The combination of cylinder A, abutment-chamber B and the valve-chamber C at one side of said cylinder, the heads F F closing the ends of the cylinder and chambers B C,  
15 the inner cylinder G G, supported by said heads, the shaft H extending through the

heads, a disk I on said shaft and the piston J attached to said disk; the abutment-block K occupying chamber B, rod L attached to the block K, frame N M on the chamber, rod L  
20 extending through said frame, and a spring O on said rod, valve P Q occupying the chamber C, crank-arm on valve-shaft P; and the cam-wheel R on shaft H operating said crank and valve, all constructed to operate substan-  
25 tially as described.

Signed by me at Cleveland, Ohio, this 21st day of February, 1902.

VICTOR A. RICE.

Witnesses:

GEO. W. TIBBITTS,

EDWARD F. SPURNEY.