

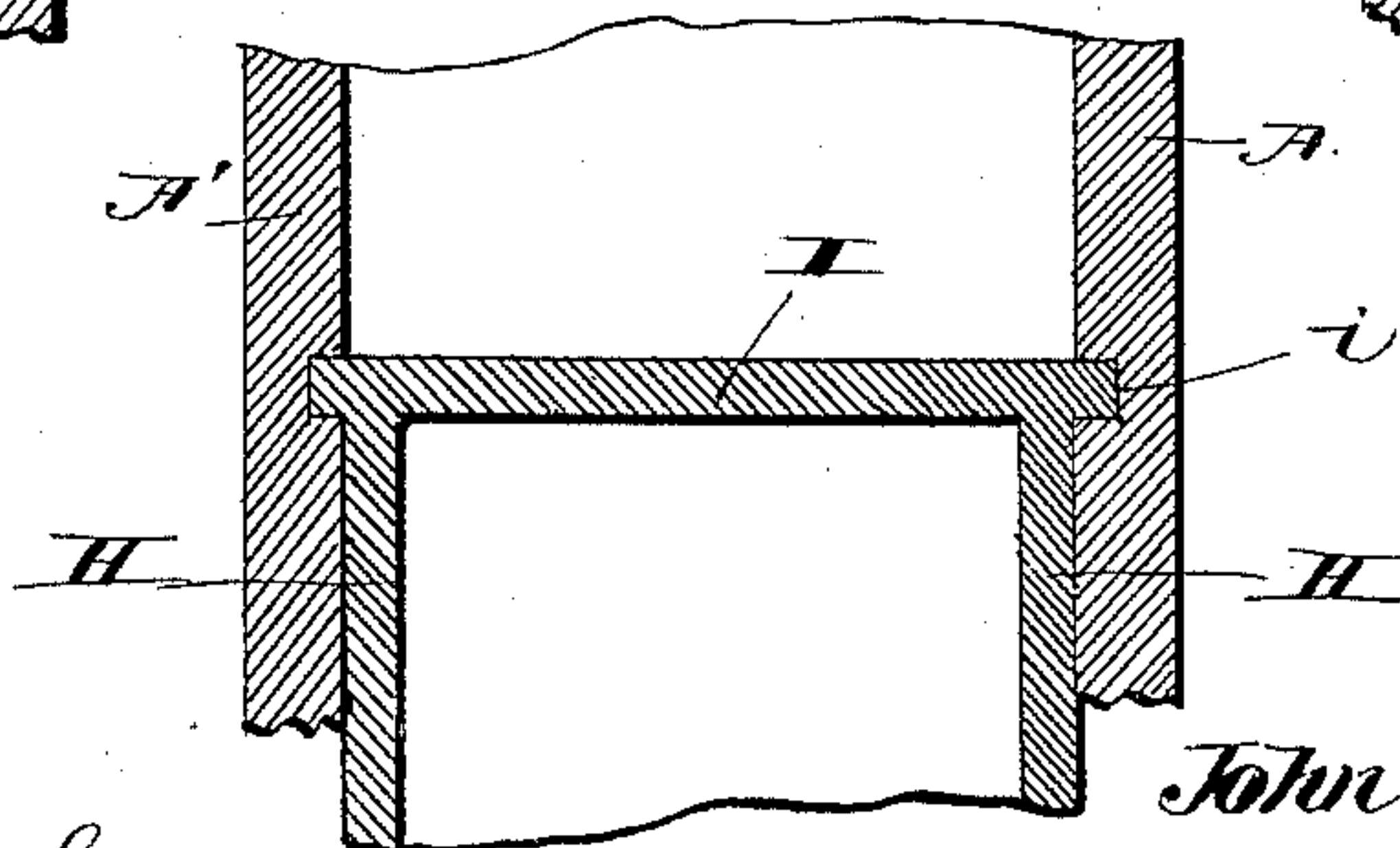
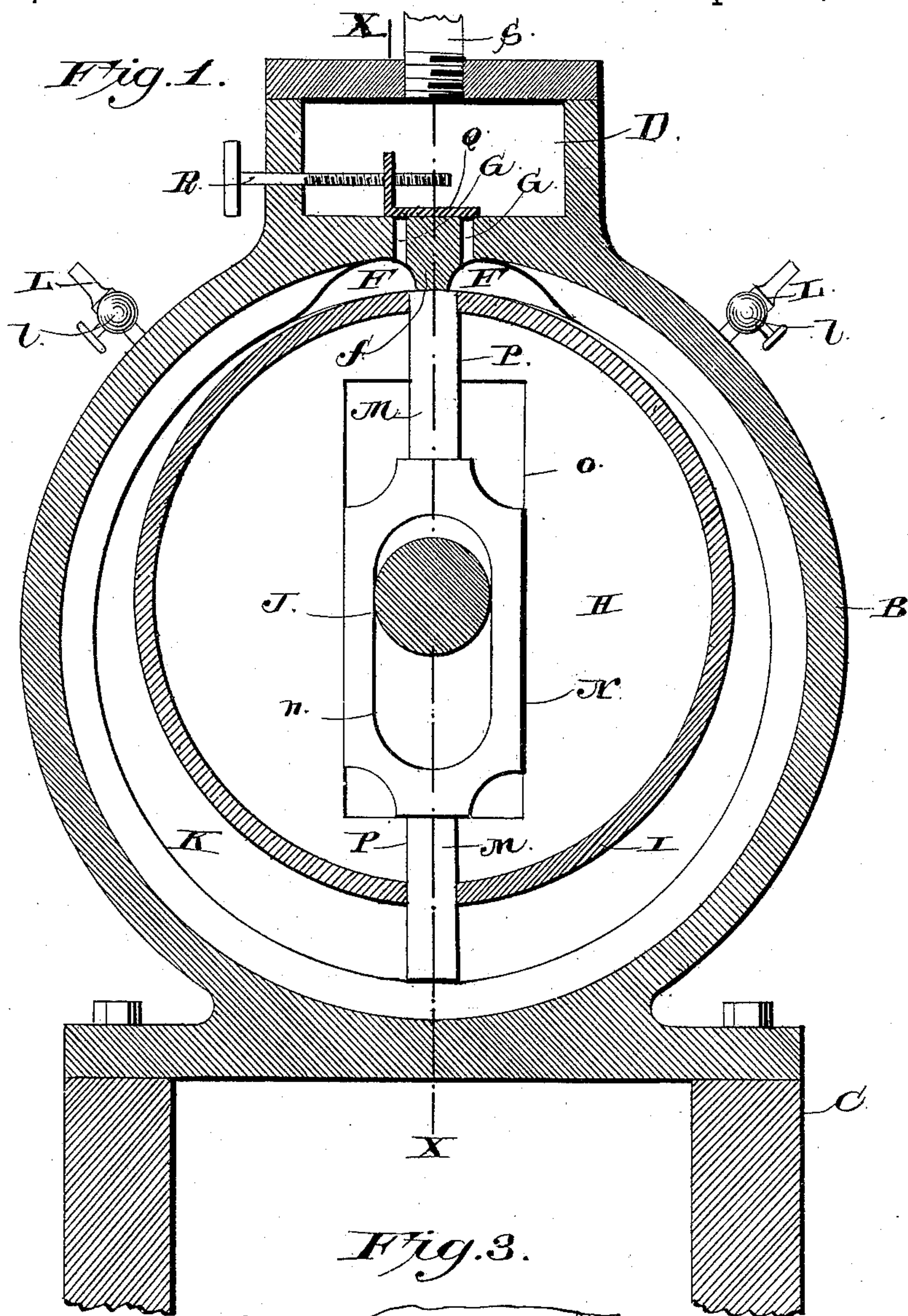
(No Model.)

2 Sheets—Sheet 1.

J. F. HINES, Sr.
ROTARY ENGINE.

No. 401,835.

Patented Apr. 23, 1889.



Witnesses.

M. E. Sawyer
E. J. Siggers

Inventor.

John F. Hines, Sr.

By *His Attorneys*

C. A. Snow & Co.

(No Model.)

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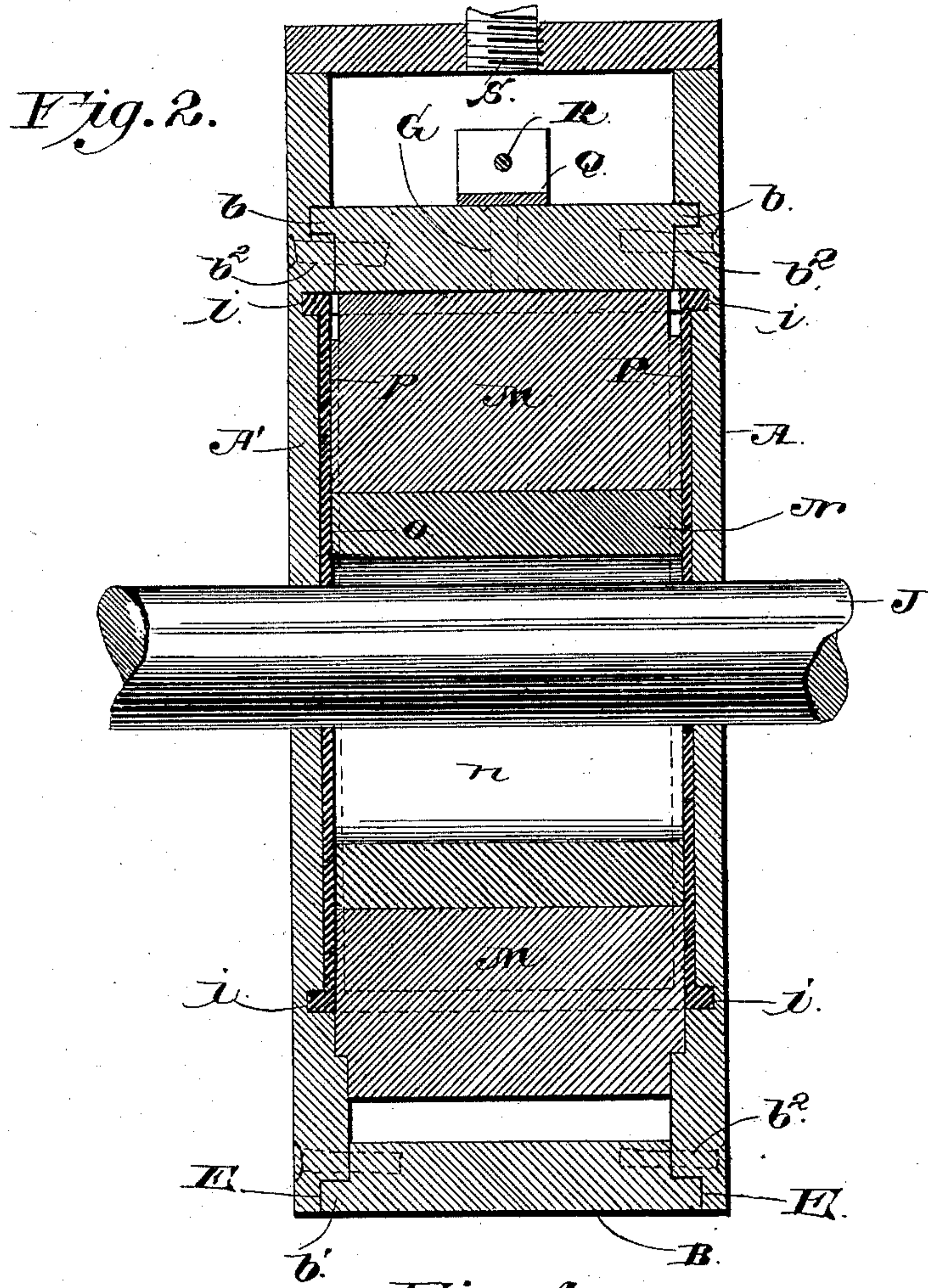


Fig. 4.

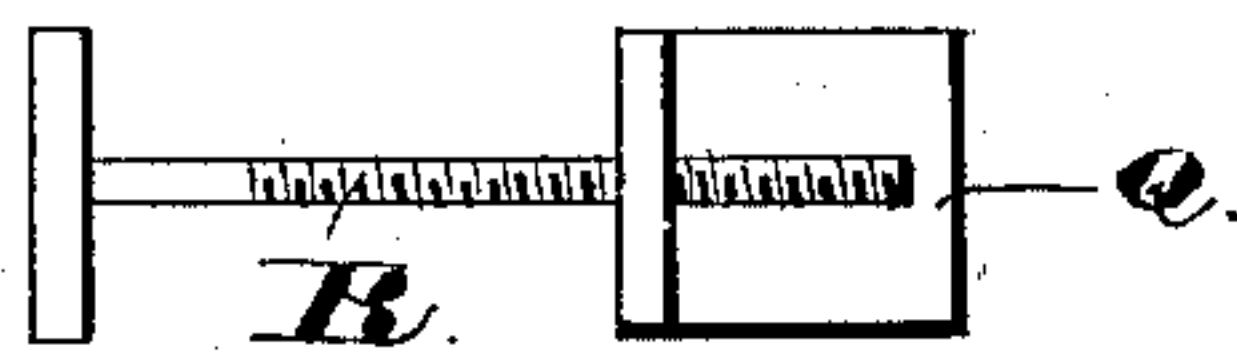
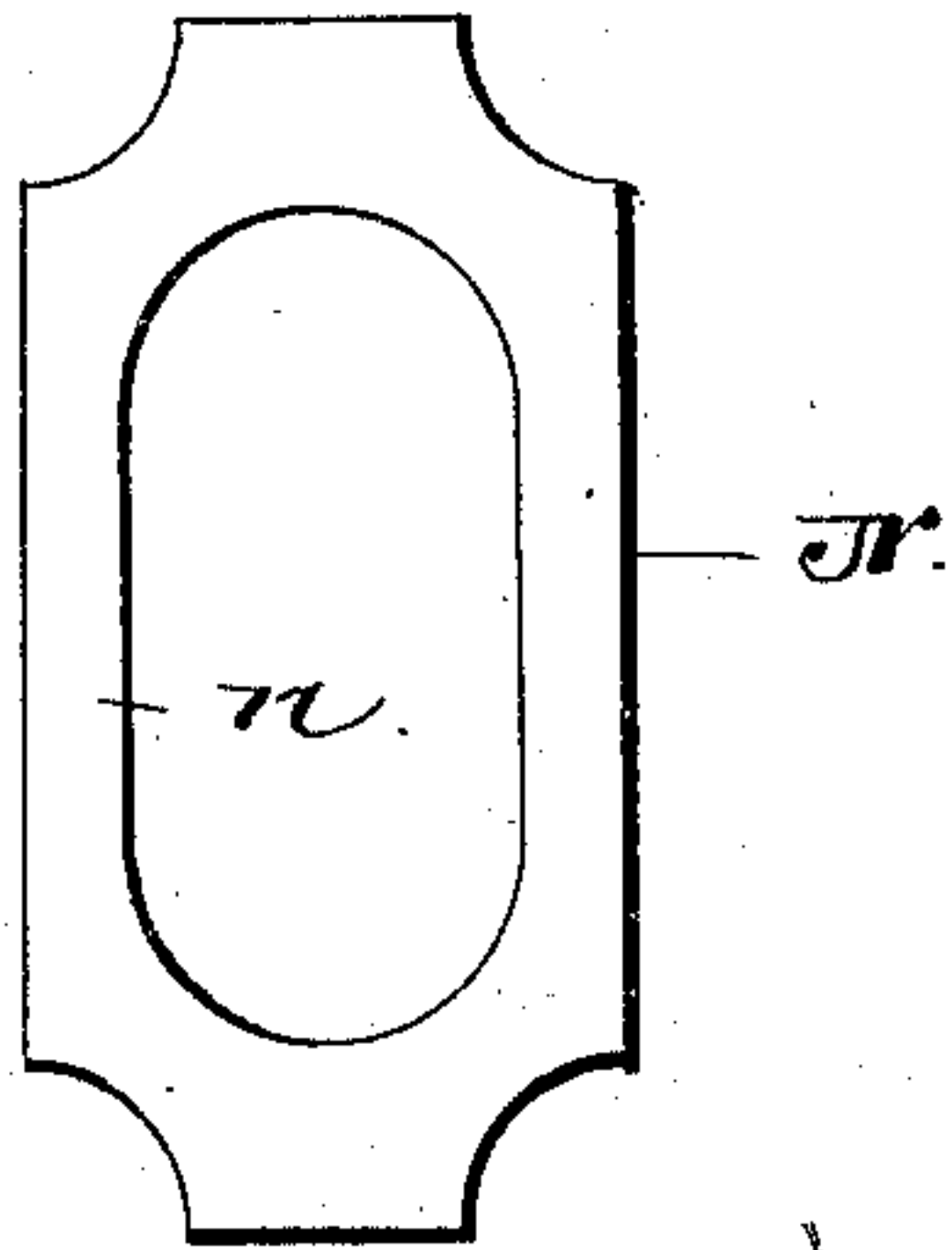


Fig. 5.



Witnesses

M. Fowler.
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Inventor,
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UNITED STATES PATENT OFFICE.

JOHN FLETCHER HINES, SR., OF SAN ANTONIO, TEXAS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 401,835, dated April 23, 1889.

Application filed September 11, 1888. Serial No. 285,115. (No model.)

To all whom it may concern:

Be it known that I, JOHN FLETCHER HINES, Sr., a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented a new and useful Improvement in Rotary Engines, of which the following is a specification.

This invention relates to rotary engines, and has for its object to provide an engine that is adaptable to all kinds of work, and which is capable of running the heaviest locomotive and the lightest sewing-machine with equal ease and satisfaction.

A further object of the invention is the provision of an engine that will be simple, cheap, compact, and durable, and which can be conveniently handled and manipulated by a person after a short time, and which is wholly under the control of the attendant, being easily shut off or reversed at will and by the same means—to wit, the valve in the steam-chest. The reversing or shut-off valve controls the induction-ports solely, the eduction-ports being controlled by separate and independent valves. The wheel located eccentrically in the cylinder is provided with two sliding pistons, which work through openings in the periphery of the said wheel. The sliding pistons are supported at their inner ends by a radially-sliding block, which is mounted on the shaft of the engine.

The improvement consists in the novel features and peculiar construction and combination of the parts, which will be hereinafter more fully described and claimed, and shown in the drawings, in which—

Figure 1 is a vertical cross-section of an engine of my invention. Fig. 2 is a vertical longitudinal section on the line $x x$ of Fig. 1. Fig. 3 is a detail view of the opposing sides of the ends of the wheel. Fig. 4 is a plan view of the reversing or slide valve. Fig. 5 is an end view of the support or sliding block.

The cylinder, composed of the head-plates A A' and the rim or band B, is supported on the bed C, and is provided with the steam-chest D. The heads have grooves or channels E near their outer edges on their opposing faces, which receive tongues b on the ends of the band B. The flanges b' near the ends of the band B are adapted to rest against the heads A A' near their outer edges, and

are held to said heads by the bolts b^2 , which pass through the said flanges b' and the heads. The band of the cylinder is recessed opposite the steam-chest to form the two chambers F F, which have communication with the steam-chest through the ports G G. The two chambers F F are separated by the wall f , which has its inner end flush with the inner periphery of the band B.

The wheel, composed of the ends H H and the rim I, is mounted on the shaft J, which is journaled eccentrically in the cylinder-heads A A', and has the ends of the rim I extended and fitted in grooves i in said heads A A'. The outer periphery of the wheel bears against the inner end of the wall f at all times, to preserve a steam-tight joint and prevent the leakage of live steam. The steam-space K extends from one side of the wall f around the wheel to the other side of the wall and communicates at each end with the steam-chest through the chambers F F and the ports G G. The exhaust-ports L L near each end of the steam-space are controlled by independent valves, as $l l$, for a purpose hereinafter to be more fully described.

The sliding pistons M M, two being provided, work through openings in the wheel and have their inner ends resting against the block or support N, located within the wheel, and having its ends fitting in the recesses O in the inner sides of the ends H H. The recesses O are sufficiently long to permit the block N having a free movement at right angles to the axis or shaft J of the engine. This block is mounted on the shaft J and has an opening, n , which is oblong, to allow the free movements of the block. The pistons work in radial grooves P in the ends H H. These grooves P are just long enough so that the outer ends of the pistons will come flush with the outer periphery of the wheel when the said pistons are moved into their utmost limit. The slide-valve Q in the steam-chest is a flat plate, and is operated by the rod R, which passes through the steam-chest, and is adapted to close either or both ports G G.

The operation is as follows: Steam enters the steam-chest through the inlet-pipe S and passes to the steam-space K through one of the steam-ports G. The steam, pressing against the side of the piston nearest the open

port, forces the piston around, carrying with it the wheel and the shaft J. The exhaust-port being open at the end of the steam-space opposite the entrance of the steam, provision
5 is had for the escape of the steam which has spent itself, the said steam exhausting the moment the piston passes the said exhaust-port. By closing the inlet and the exit ports and opening the other inlet and exit ports
10 the motion of the engine will be reversed. When both inlet-ports are closed, the engine is motionless. As the wheel revolves, the pistons and the block receive a longitudinal or radial movement to adapt them to the vary-
15 ing distances in the steam-space between the wheel and the cylinders.

Having thus described my invention, I claim—

In a rotary engine, the cylinder having the
20 ports G, the wall or offset *f* between them and

the recesses F on opposite sides of said offset, the steam-chest, the valve I, the screw R, to move the same over either or both of the ports, and the independent valved escape-ports, in combination with the wheel mounted
25 eccentrically in the cylinder and having the guide-recesses O in its heads, the block N in said recesses, having the oblong slot *n*, clearing the wheel-shaft, and the radial pistons M, secured to opposite ends of the block and
30 working through openings in the periphery of the wheel, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN FLETCHER HINES, SR.

Witnesses:

F. J. VAN BIBBER,
CHAS. H. HINES.