

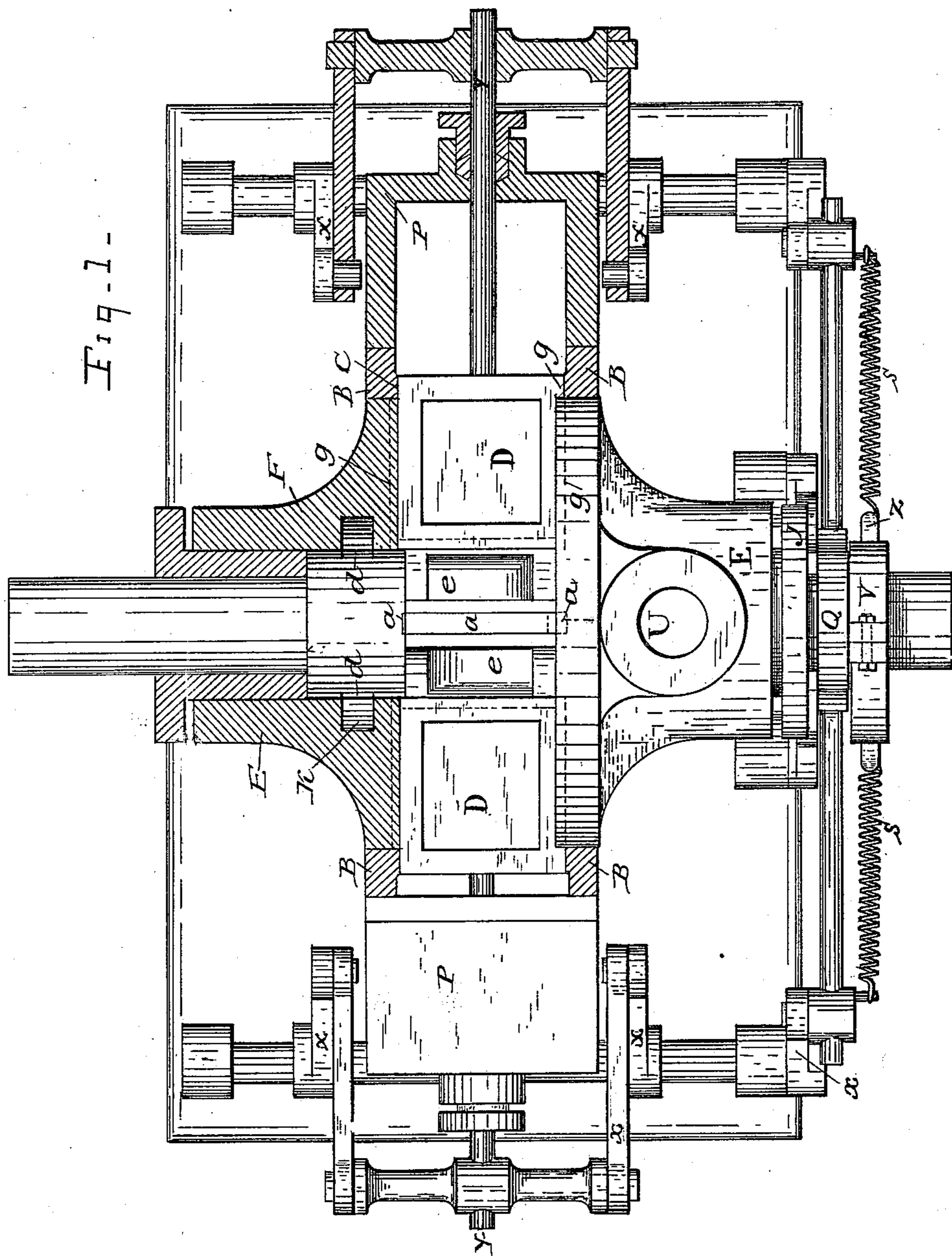
(No Model.)

5 Sheets—Sheet 1.

A. LESPERANCE.
STEAM ENGINE.

No. 550,919.

Patented Dec. 3, 1895.



WITNESSES:

H. W. Boardman
Edwin P. Thompson

INVENTOR

Alexander Lesperance

(No Model.)

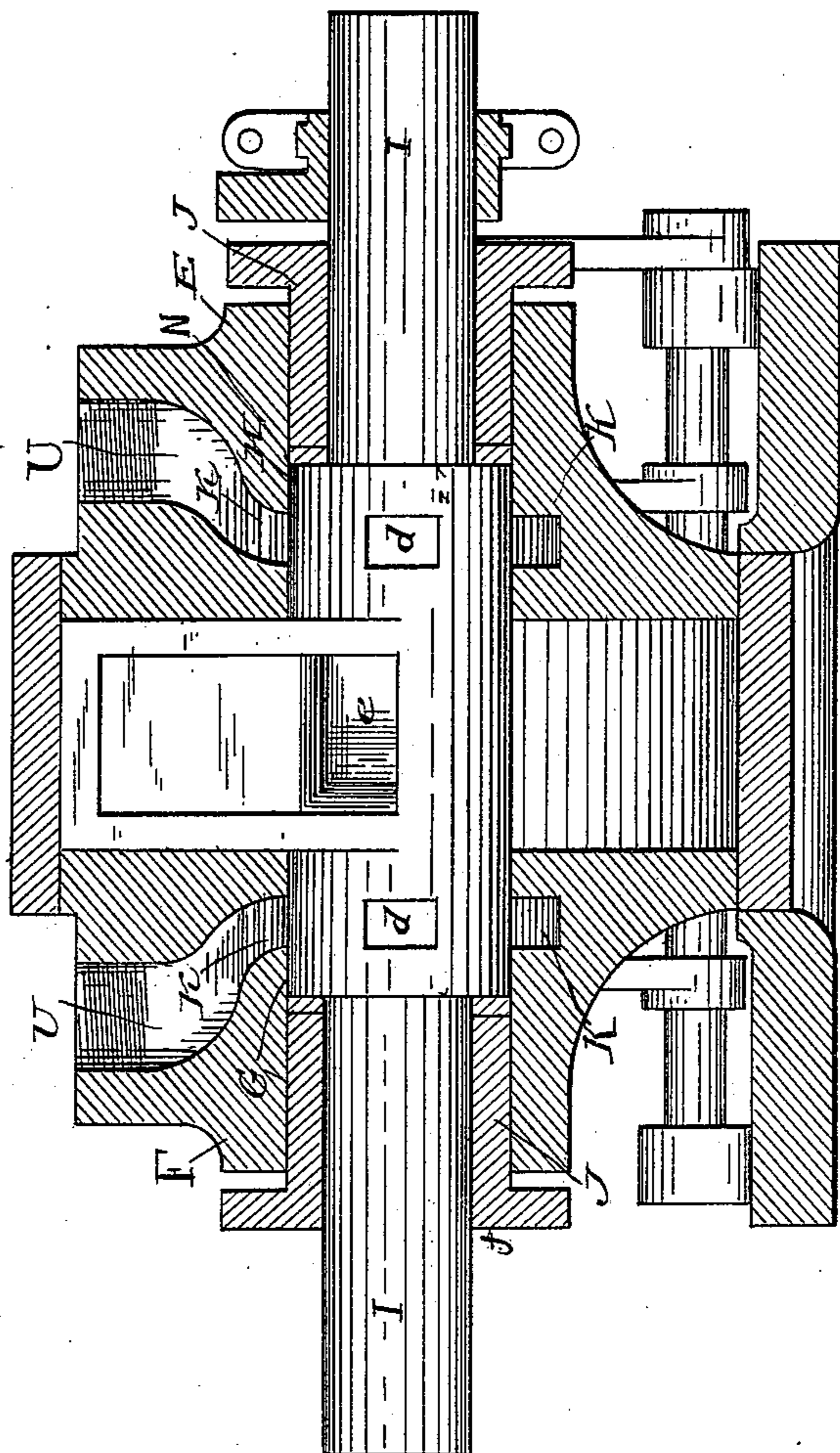
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A. LESPERANCE.
STEAM ENGINE.

No. 550,919.

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Fig. 2 -



WITNESSES:

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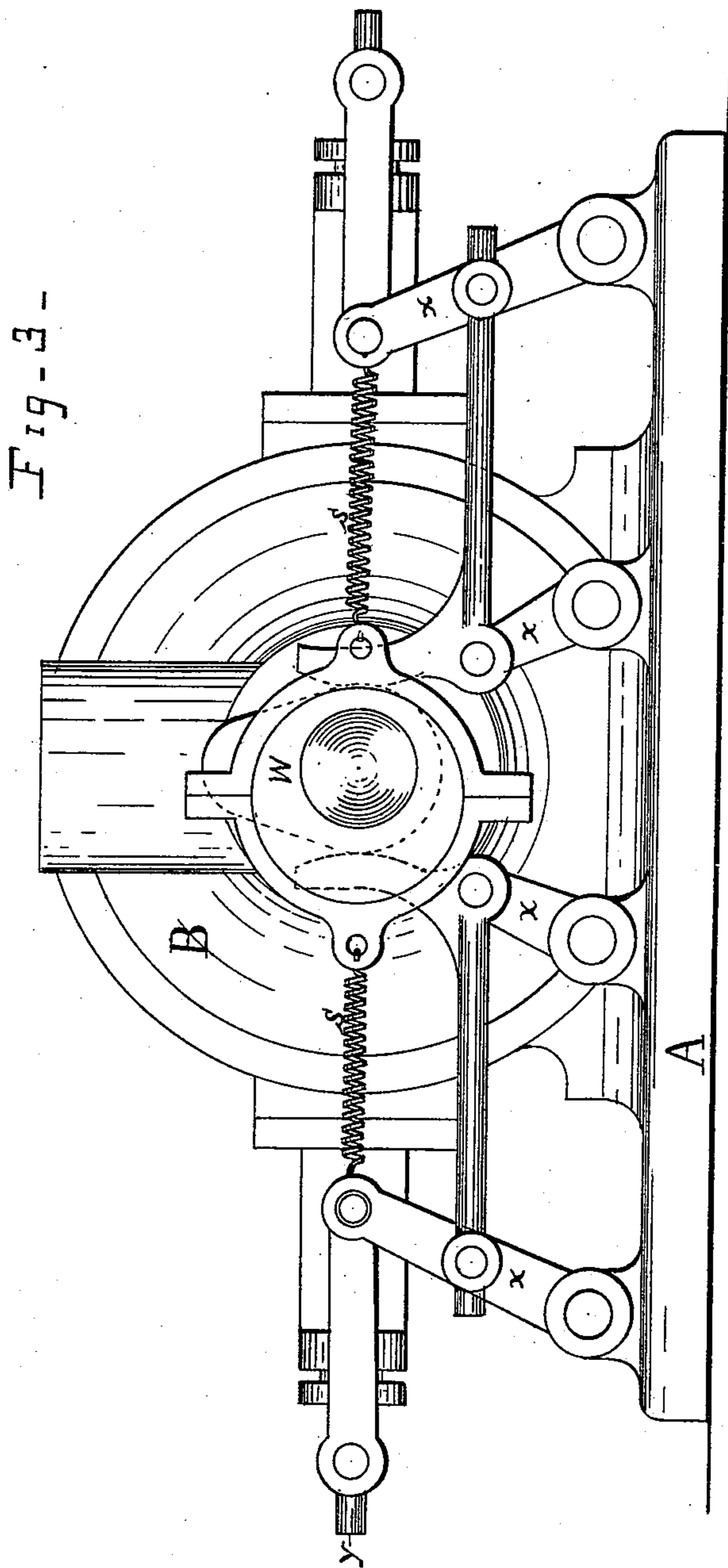
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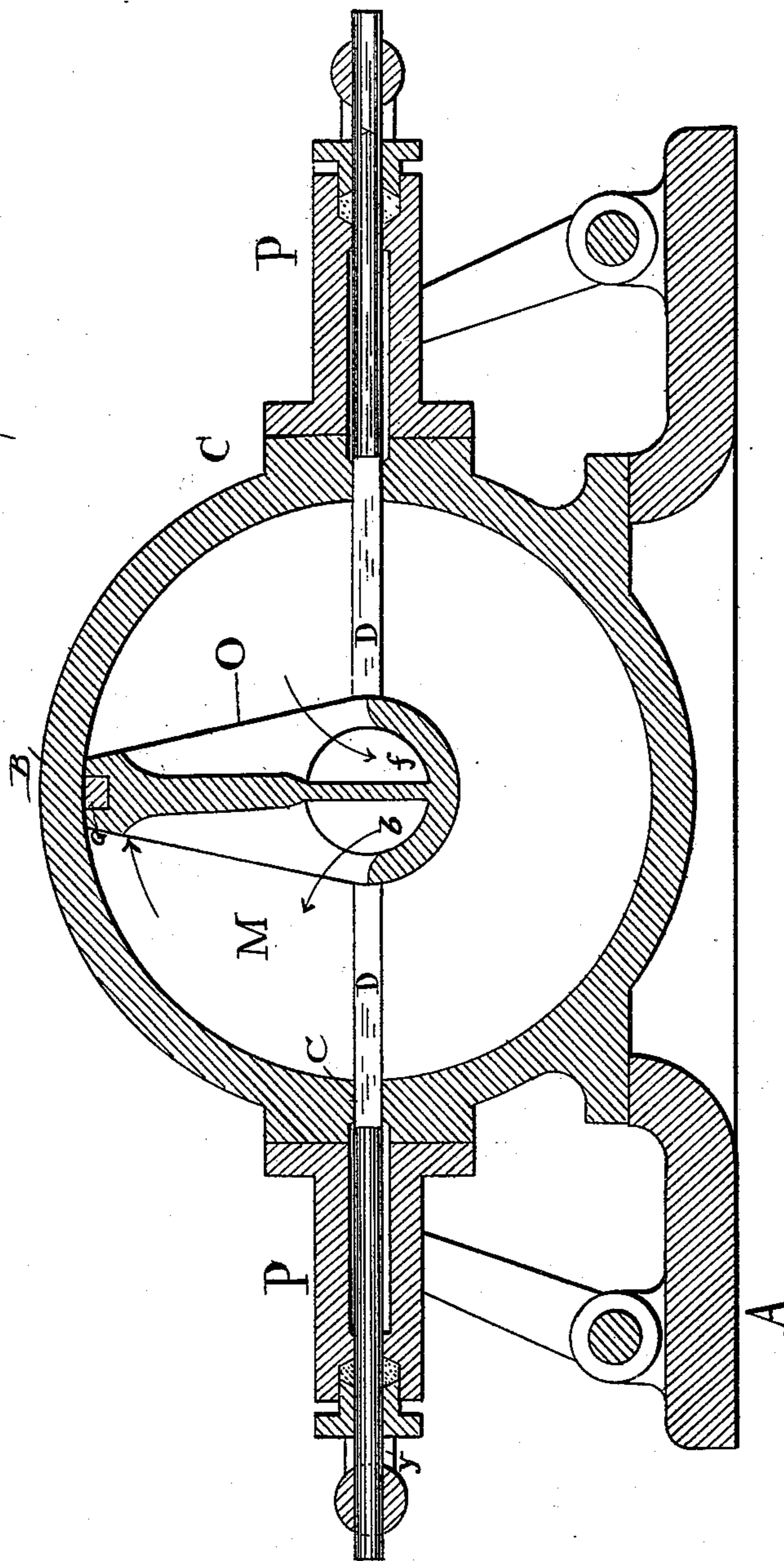
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A. LESPERANCE.
STEAM ENGINE.

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Fig - 4 -



WITNESSES:

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(No Model.)

5 Sheets—Sheet 5.

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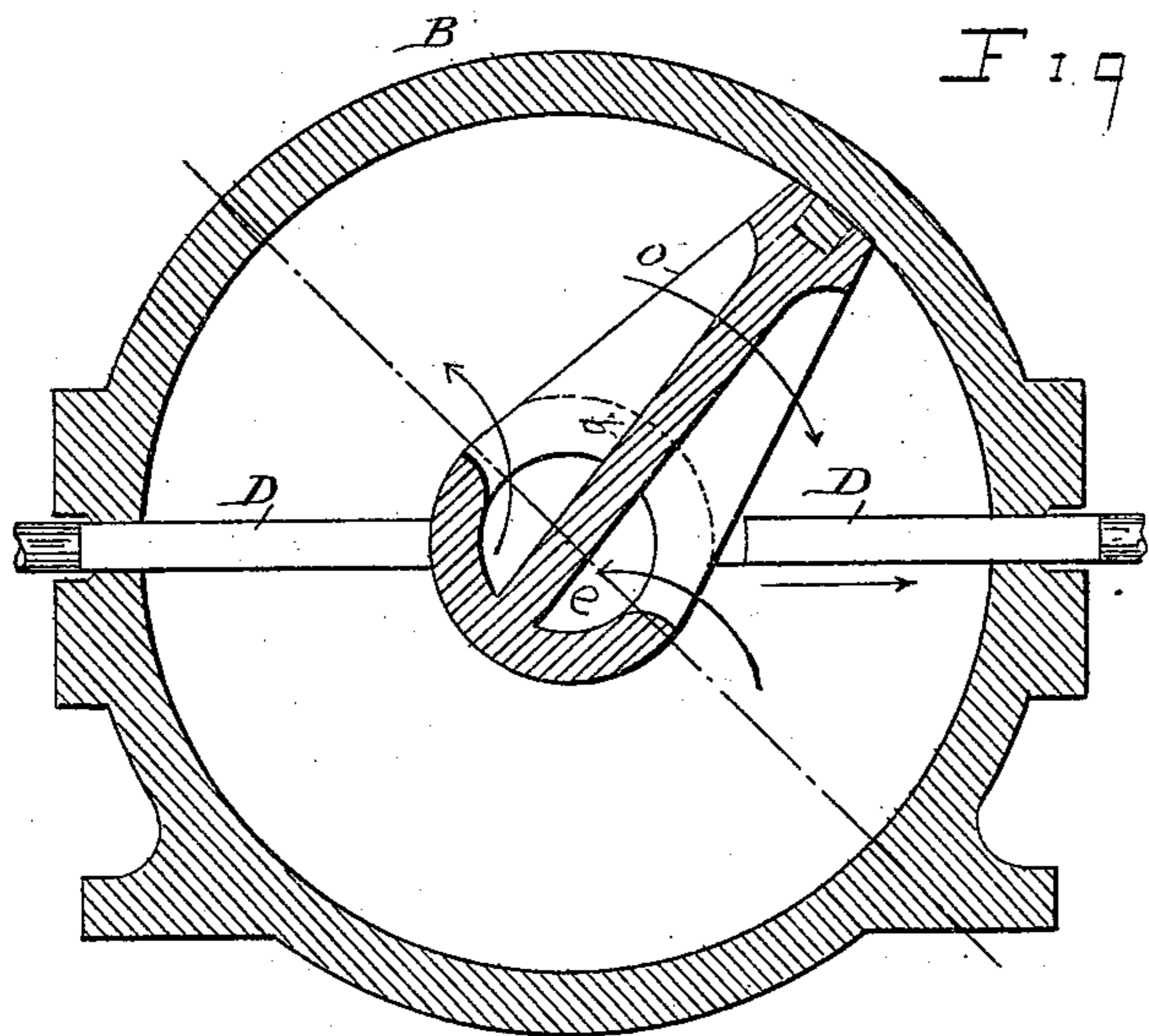


Fig - 6 -

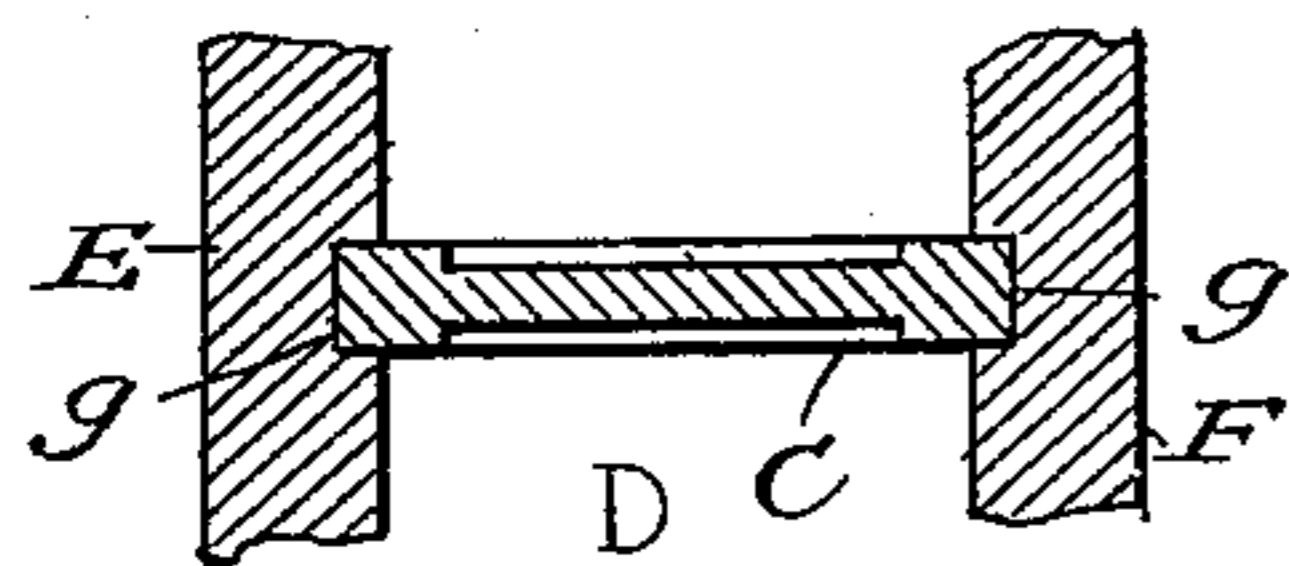
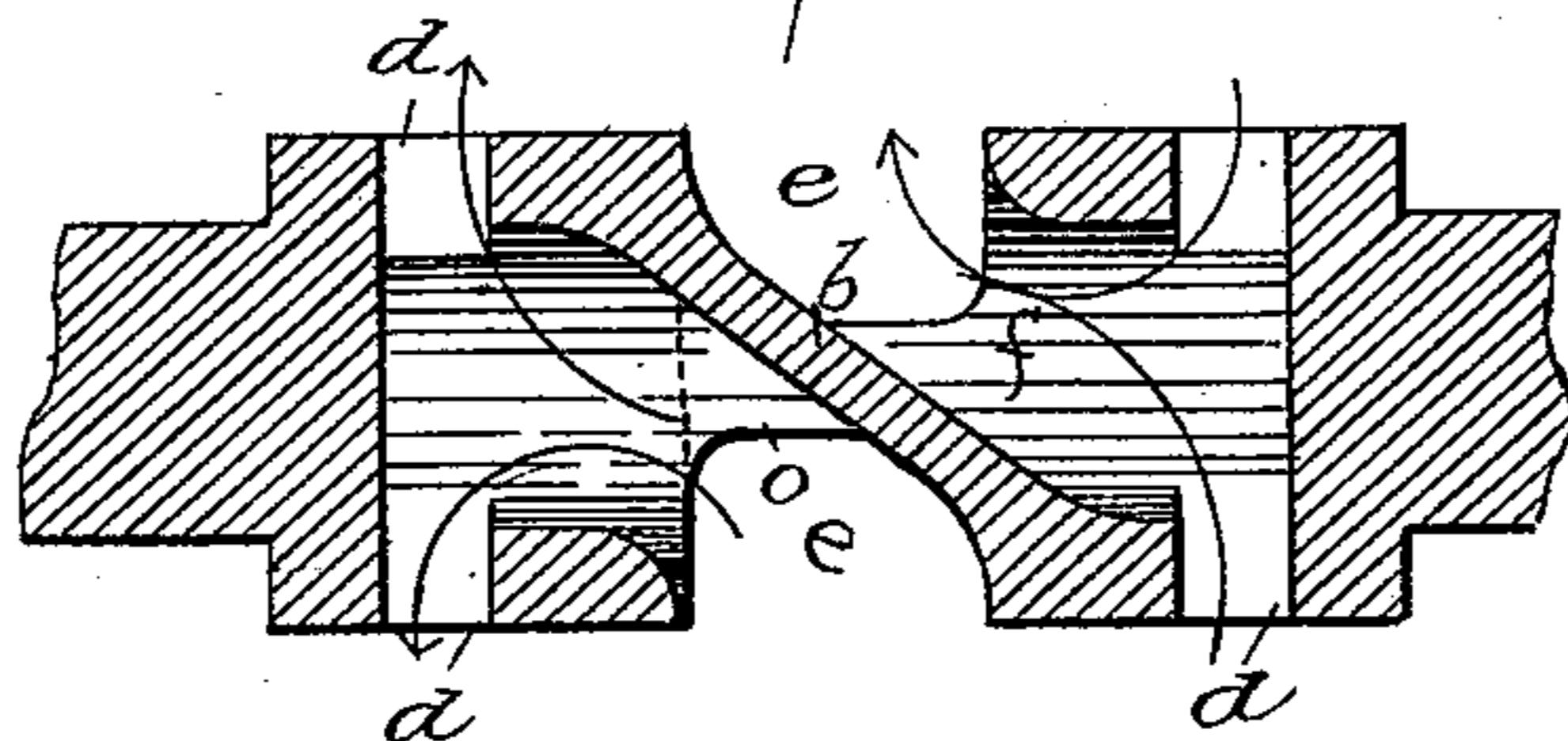


Fig - 7 -



WITNESSES:

H. W. Boardman
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UNITED STATES PATENT OFFICE.

ALEXANDER LESPERANCE, OF LACONIA, NEW HAMPSHIRE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 550,919, dated December 3, 1895.

Application filed April 16, 1895. Serial No. 545,964. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER LESPERANCE, a citizen of the United States, residing in Laconia, in the county of Belknap and State of New Hampshire, have invented a new and useful Steam-Engine, of which the following is a specification.

My invention relates to steam-engines for motive power of a unique mechanical principle and construction; and the objects of my invention are to construct an efficient engine, which is practical, economical in construction, operation, and use, compact, and applicable to more direct and more extended use than engines heretofore constructed. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general plan. Fig. 2 is a sectional elevation. Fig. 3 is an end elevation. Fig. 4 is a sectional elevation. Figs. 5, 6, and 7 are sectional details of my invention.

Similar letters and numerals refer to similar parts throughout the several views.

The bed or frame A may be made as shown in the drawings for one type of my engine, but may be varied to conform to any type of construction required to suit different uses. On said frame is supported and secured thereto the cylinder B by any means well known to mechanics. Said cylinder is turned out on the inside to give thereto the required uniformity of diameter and internal evenness and has openings C C on opposite sides for the entrance of the sliding disks or plates D D, hereinafter to be referred to and described. The ends of said cylinder B have heads E F of unique construction—i. e., they contain the bearings or boxes G H, in which the journal or shaft I of the engine works; they contain the glands J J, by which the packing around the shaft is made to prevent the escape of steam from the cylinder; they have cored therein the annular space K for the motive fluid or steam to enter and pass therefrom into the hollow shaft I, and they contain the chambers N N for the ends of the hollow shaft I to enter and work, all of which are so fully illustrated in the drawings and will be so fully apparent from the entire description that a more specific reference thereto is herein unnecessary. Said shaft I is cored out or hol-

low from point 1 to 2. (Shown in the drawings.) It is also increased in size between these points in order to furnish steam room or space for the motive fluid to pass there-through in transit from the annular grooves to the chamber wherein its motive power is applied. Ports or openings are made in the hollow shaft I (shown in the drawings) at *d d*, through which the steam enters and escapes in its passage through the shaft from the annular grooves. On said shaft I is made (and is a part thereof) the blade or disk O, which is fitted to the inside of the cylinder B, and has its end and sides packed in any well-known way (see *a a a*) for packing steam-joints, so as to prevent any escape of the motive fluid when confined between the blade and one of the sliding plates for the purpose herein indicated. In constructing said blade O and shaft I where they are united I make a winding or curved partition *b*, (like a helix,) which is an extension of said blade O through said shaft I. The blade and shaft where they are united are cored out, so as to have chambers *e e*, from which ports or openings *f f* open out, forming a connection or passage-way for the steam from the hollow shaft I into the space in the cylinder B between one of the sliding gates D and the blade O, where the force of the steam is exerted against said blade O to turn it and its shaft I. Fitted into the cylinder B, on opposite sides, are two sliding gates or plates D D. Made onto said cylinder, on like opposite sides, are two chambers P P to receive said sliding gates D D. Said gates are fitted to slide in grooves *g g* made in the heads E F of the cylinder B. Said gates are operated or caused to move in and out by means of the cam Q forcing them out, while the springs S S draw them into the cylinder and against the hollow shaft, as respectively required. Where they come in contact with or against the hollow shaft they are provided with packing to make a steam joint or fit. For the purpose of aiding or extending the more effective operation of the springs S S, I unite them to an eccentric-ring V by eyes or nuptions Z, made on said ring V. The eccentric-cam W is secured to the shaft I and is timed so as to release the pressure or strain on the outgoing gate at the same time that it increases the strain or tension on the incom-

ing or closing gate and reverses as the movements of the gates reverse. The other ends of the springs S S are connected with the stems Y Y of the gates and operate said gates to close them either by direct attachment or by means of intermediate leaves and arms, as different constructions may require, one system of which I have shown on the drawings at X X X X.

10 In practice my invention operates as follows, to wit: Steam is admitted into annular groove K through the openings U in the heads EF of the cylinder B at either side, as it may be predetermined which way to turn or operate the shaft, it being apparent that the exhaust-steam will escape from the opposite ports or openings. The steam passes from these annular grooves K through the ports or openings *d* into the hollow shaft I. Continuing on its passage inside of said hollow shaft I it strikes against and is directed by the helical partition *b* of the shaft I and blade O, so as to pass from said hollow shaft I through the ports or openings *f f* into that part of the cylinder M between said blade O and one of the sliding valves D. While confined in this chamber its expansive force or power is expended against the blade O, which forces it and the shaft I to revolve, thus furnishing or communicating the power of the motive fluid to any uses for which it is intended. Said sliding gates (valves or plates) are timed to move out of the cylinder B into the chambers P P when the blade O has reached the point where it is to pass by the place in the cylinder occupied by the retired sliding gate and to immediately return to its place in the cylinder after the blade has passed by. When the sliding gate or plate is closed into its place in the cylinder, it forms a part of the chamber containing the live or operative fluid, the blade O and part of the side and ends of the cylinder forming the rest of the chamber, which holds said live steam until said blade O passes the place occupied by the other sliding gate, and said last gate is returned to its place in the cylinder, at which time this last gate, the blade O, part of the ends, and part of the side of the cylinder form the new chamber for the live steam or fluid to exert its force in against the side of the blade O, which is moving away from said last-closed gate. At the same time that the sliding gate (or plate) has so closed that it forms a part of the cham-

ber holding the live steam the partition *b* has reached the point where it becomes the dividing wall or partition between the live steam and the dead steam in the cylinder, leaving the ports on the one side or end of the cylinder open to receive the live steam, while the ports on the opposite side or end are at the same time open to allow the exhaust or dead steam to freely escape, so that at all times that part of the cylinder receiving the operative or live steam has a full head or force of steam therein without any cut-off and that part holding the dead steam has a free exhaust and entire relief from any back or counter pressure from the dead steam. While I have called the sliding plates D "plates," "gates," or "valves," it will be seen that they are not valves in the sense the word or term "valve" is commonly used to designate the reciprocating or opening and closing valve for the entrance and exhaust of steam in a steam-engine. As said plates D have no such function, they act to form a removable part of the cylinder to allow the blade O to pass by. The entrance of steam is always open through the annular groove and the hollow shaft into the cylinder at the one end, and the exhaust is always open from the cylinder through the opposite end of the hollow shaft and the opposite annular groove. The movement of the sliding gates or plates, as and at the proper time, is effected by means of the cam Q and the springs S S, and is clearly shown in the drawings and hereinbefore fully described.

What I claim, and desire to secure by Letters Patent, is—

A rotary engine, comprising cylinder heads having openings U, bearings or boxes G, H, with packing glands J in extension thereof, and having annular recesses therein, shaft I having an enlarged medial portion with its ends opposing the glands, the medial portion being furnished with ports *d*, and passages *f* on opposite sides of winding partition *b* in continuation of blade O, and with ports *e e*, sliding gates and a means of operating the gates, all as described for the purposes set forth.

ALEXANDER LESPERANCE.

Witnesses:

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EDWIN P. THOMPSON.