

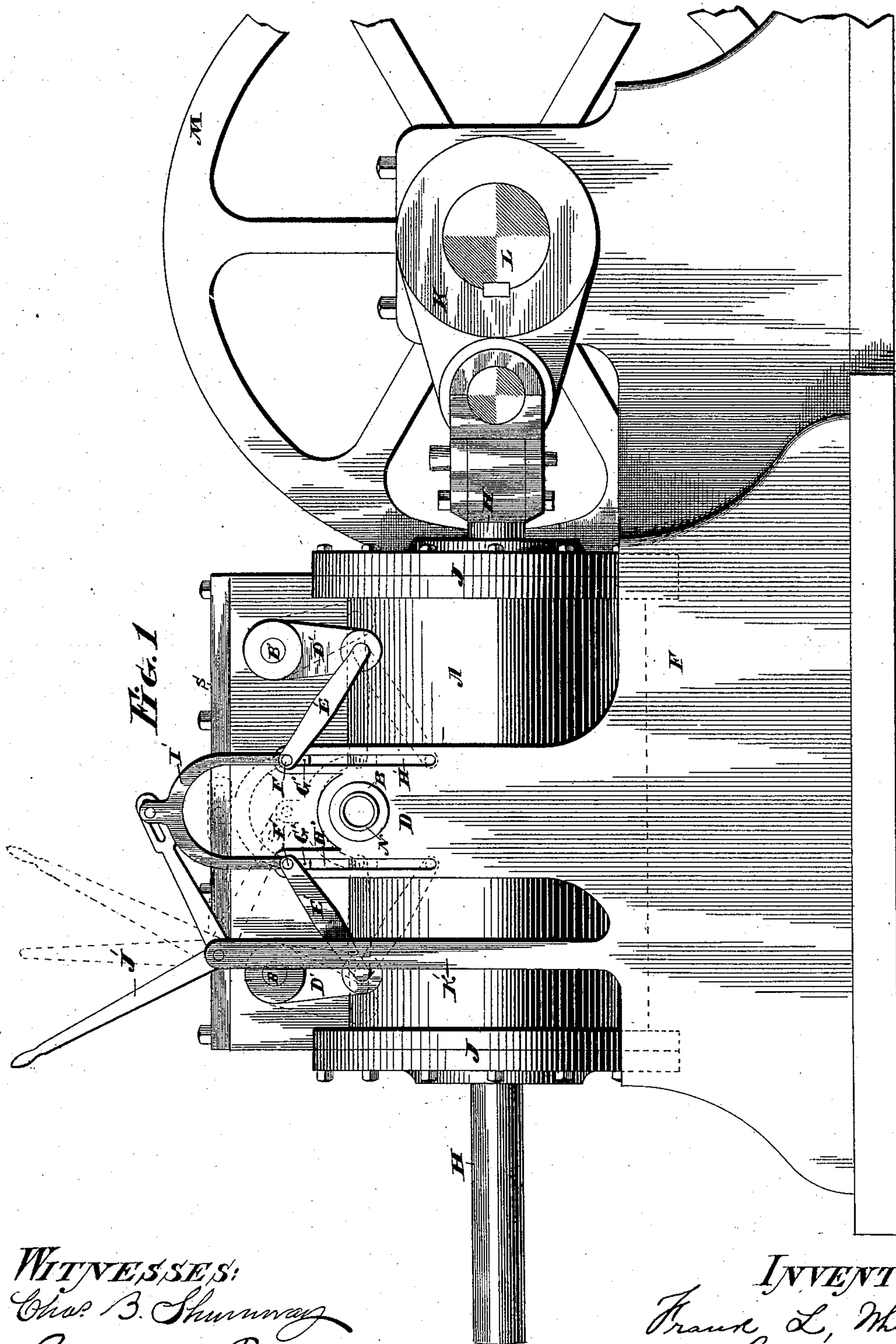
(No Model.)

3 Sheets—Sheet 1.

F. L. WHEELER.
OSCILLATING ENGINE.

No. 372,348.

Patented Nov. 1, 1887.



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(No Model.)

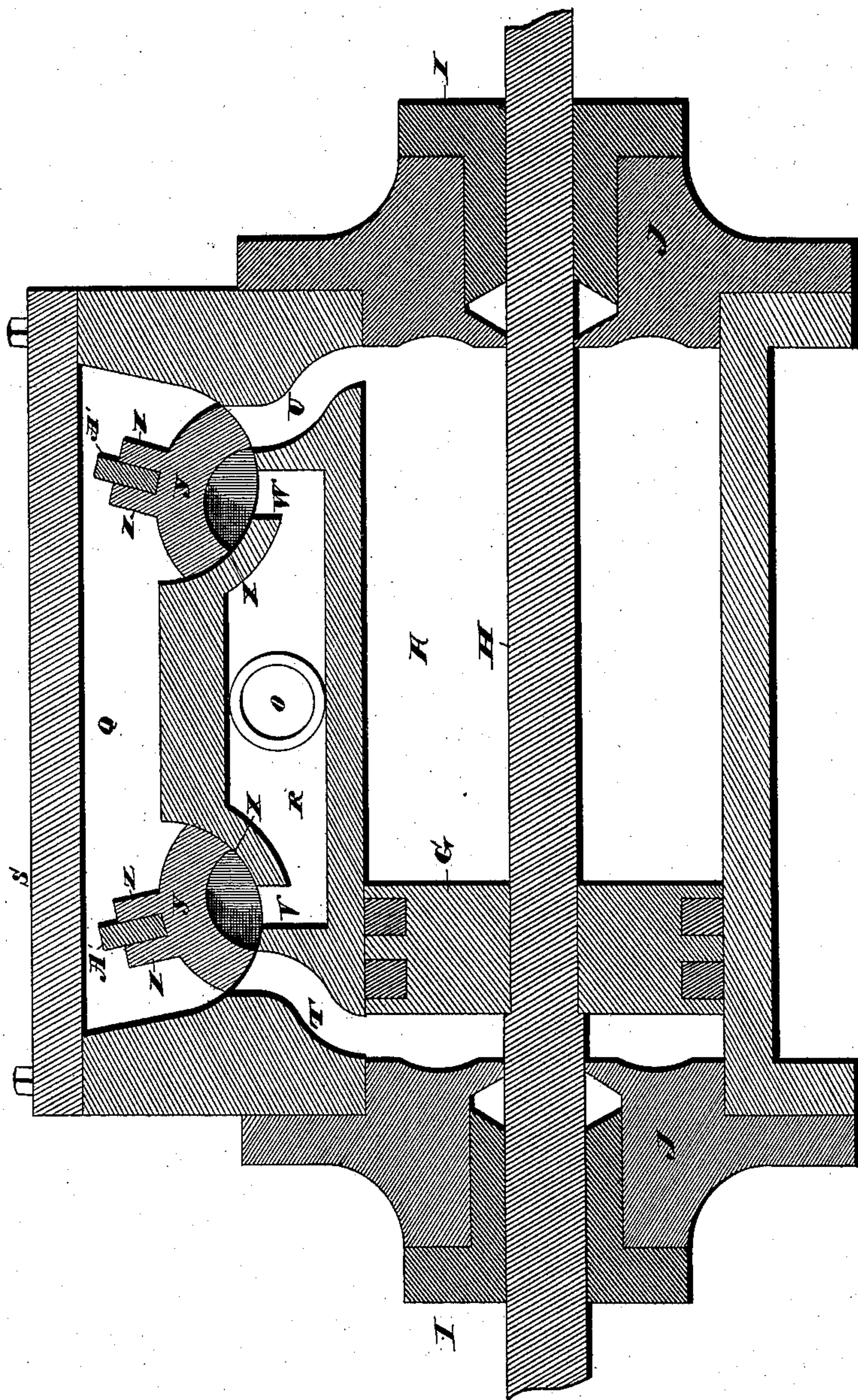
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OSCILLATING ENGINE.

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Fig. 2



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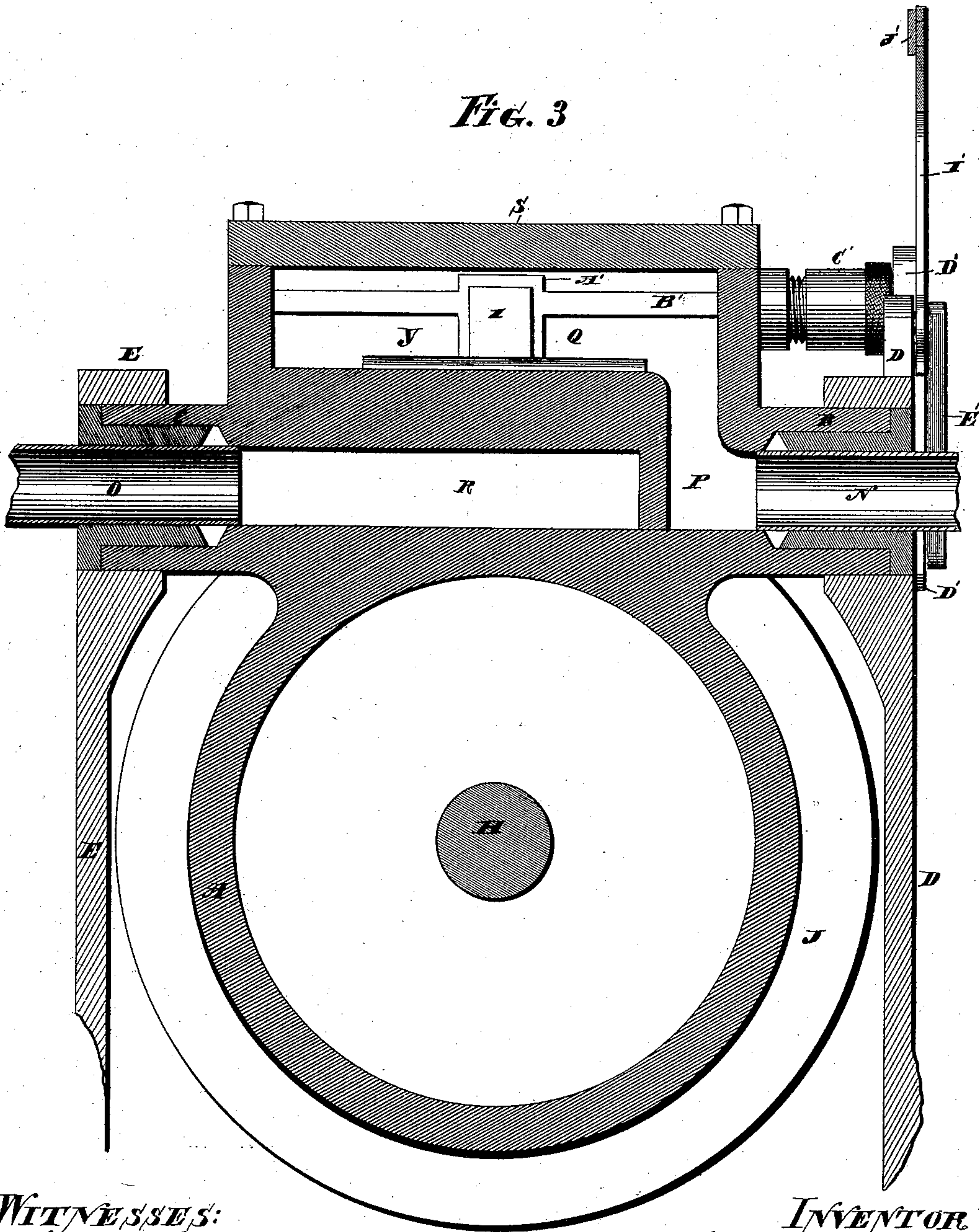
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OSCILLATING ENGINE.

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Fig. 3



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UNITED STATES PATENT OFFICE.

FRANK L. WHEELER, OF SOUTHTON, CONNECTICUT, ASSIGNOR OF ONE-HALF TO EDWARD M. LEWIS, OF SAME PLACE.

OSCILLATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 372,348, dated November 1, 1887.

Application filed January 17, 1887. Serial No. 224,516. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. WHEELER, residing at Southington, in the county of Hartford and State of Connecticut, have invented
5 certain new and useful Improvements in Oscillating Engines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this
10 specification.

My invention relates to an improvement in oscillating engines, the object being to produce a simple, cheap, durable, economical, and efficient motor.

15 With these ends in view my invention consists in an oscillating engine having certain details of construction and combination of parts, as will be hereinafter described, and pointed out in the claims.

20 In the accompanying drawings, Figure 1 is a view in side elevation of an engine embodying my invention. Fig. 2 is a view of the cylinder and steam-chest in vertical longitudinal section; and Fig. 3 is a view thereof, in
25 transverse section, showing also the operating connections of one of the valves.

The cylinder A is provided with hollow trunnions B and C, having bearing in the uprights D and E of the standard F, which may
30 be of any suitable construction. The piston G is secured to a piston-rod, H, playing in packings I I, located in the respective heads J J of the cylinder, and connected in the usual manner with the crank K, which is secured to
35 a crank-shaft, L, carrying a fly-wheel, M, as shown. A live-steam pipe, N, is connected with the trunnion B, and an exhaust steam pipe, O, with the trunnion C, such pipes having
40 suitable live-steam supply and discharge connections. The pipe N leads into a live-steam passage, P, opening into the steam-chest Q, which, with the exhaust-chamber R, located below it, is formed in the same casting with
45 the cylinder, the chest being closed in at the top by a cover, S, bolted in place.

Short live-steam ports T and U, respectively located at the opposite ends of the steam-chest, connect the same with the opposite ends of the cylinder, while exhaust-ports V and W,
50 located just inside of the ports T and U, con-

nect the steam-chest with the opposite ends of the exhaust-chamber, from which the exhaust-pipe O leads through the trunnion C, as described.

The said ports T and U and V and W intersect the bottoms of the two curved valve seats, X X, located at the opposite ends of the steam-chest and, respectively, receiving the segmental valves Y Y, which are shaped to fit the
55 curved seats, closed at their ends and each provided with two upwardly-extending lugs, Z Z, as shown. Blocks A' A', fitting between the lugs of the respective valves, couple the same
60 with the rocking-shafts B' B', upon which they are located, the said shafts being journaled in the opposite walls of the steam-chest, and each having one end projecting through the same wall thereof.

Adjustable packings C' are provided for the projecting ends of each shaft. Cranks D' D',
70 secured to the said ends of the shafts, are pivotally connected at their opposite ends with links E' E', having their adjacent ends connected through pins F' F' to sliding blocks G' G', reciprocating in vertical slots H' H',
75 formed in the upright D of the standard, the said upright being located between the valves. A coupler or yoke, I', connecting the said links, is itself attached to a bell-crank lever, J', fulcrumed upon an upright, K', the yoke, and
80 hence the links, being lowered and raised by such bell-crank lever.

The valves and their described connections are constructed so that when the links are in line with the trunnions the cylinder will not
85 take steam, however rocked. To start the engine, then, the bell-crank lever is operated to move the adjacent ends of the links above or below the trunnions and the steam turned on. It will enter the engine, through the pipe
90 N in the trunnion B, pass through the passage P, and enter the steam-chest. Then, under the conditions represented by Fig. 2 of the drawings, it will pass through the port T into the cylinder and move the piston to the
95 opposite end thereof. This movement rocks the cylinder under the valves, which remain stationary, and permits the spent steam on the opposite side of the piston from the live steam to exhaust through the live-steam port U, the
100

valve thereof, the exhaust-port W, the exhaust-chamber, and the pipe O extending through the trunnion C, as described. By the time the end of the stroke is reached, the rocking of the cylinder opens the port U and admits live steam into the cylinder and forces the piston back, while the spent steam is exhausted through the port T, the valve thereof, the port V, the exhaust-chamber, and the pipe O, aforesaid.

While the valves are not moved by the rocking of the cylinder they may be moved for regulating the amount of steam admitted into the cylinder, as circumstances of pressure or of the power required may dictate, for reversing the engine, and for stopping it without shutting off steam. The last effect is reached by operating the bell-crank lever to bring the links into line with the trunnions when the cylinder will not take steam, however rocked. To start the engine, the lever is operated to raise the links above or lower them below the trunnions, the amount of steam admitted to the cylinder increasing as they are moved away from the trunnions and decreasing as they are moved toward them.

Under the described construction the valves are radially movable relative to their shafts and automatically adjust themselves in taking up all wear between their working-faces and the valve-seats. Furthermore, the valves, being closed at their ends, will never leak at such points.

By employing two sets of valves and ports, and respectively locating them at opposite ends of the steam-chest, the ports are shortened, whereby the friction of the steam and the time occupied by it in reaching the cylinder are reduced to the minimum, with obvious gain in economy and efficiency.

If desired, the bell-crank lever and yoke may be replaced by other means for simultaneously raising and lowering the links. I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as are fairly within the spirit and scope of my invention.

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

1. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live-steam and exhaust ports, valves for such ports, and means for holding such valves while the cylinder is rocked under them and for simultaneously adjusting them, substantially as set forth.

2. In an oscillating engine, the combination, with a cylinder, of a steam chest provided with live-steam and exhaust ports, valves for such ports made adjustable for excluding steam from the cylinder without shutting it off from the steam-chest and for reversing the engine, and means for holding the valves

while the cylinder is rocked under them, substantially as set forth.

3. In an oscillating engine, the combination, with a cylinder rocking on trunnions, of a steam-chest provided at each end with a live steam and an exhaust port, valves for such ports, and connections between such valves and an upright adjacent to the cylinder, substantially as set forth.

4. In an oscillating engine, the combination, with a rocking cylinder, of a steam-chest provided with live-steam and exhaust ports, valves for such ports, a fixed support located adjacent to the cylinder and between the said valves, and connections between the valves and such support, substantially as set forth.

5. In an oscillating engine, the combination, with a rocking cylinder, of a steam-chest provided with live-steam and exhaust ports, valves for such ports, an upright supporting a trunnion of the cylinder, and adjustable connections between such valves and the said upright, substantially as set forth.

6. In an oscillating engine, the combination, with a rocking cylinder, of a steam-chest provided with live-steam and exhaust ports, valves for such ports, a slotted upright located adjacent to the cylinder and between the valves, and connections between such upright and the valves, whereby they are held as the cylinder rocks and adjusted to control the flow of the steam, substantially as set forth.

7. In an oscillating engine, the combination, with a cylinder rocking on trunnions, of a steam-chest provided with live-steam and exhaust ports, of valves for such ports, a fixed upright adjacent to the cylinder, connections between the valves and such upright, including two links the adjacent ends of which are connected with the upright, the valves and connections being constructed so that when the links are in line with the trunnions of the cylinder steam will be excluded from the cylinder and admitted thereto when the links are moved out of line with such trunnions, substantially as set forth.

8. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live-steam and exhaust ports, a fixed upright adjacent to the cylinder, provided with vertical slots, and connections between the valves and the upright, including pin-blocks sliding in the slots of the latter, substantially as set forth.

9. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live-steam and exhaust ports, a fixed upright adjacent to the cylinder, connections between the valves and the upright, a coupler between such connections, and means attached to the coupler for operating it to simultaneously shift the valves, substantially as set forth.

10. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live steam and exhaust ports, valves

for such ports, a fixed upright adjacent to the cylinder, connections between the valves and such upright, a coupler between such connections, and a bell-crank lever attached to the coupler for shifting the valves, substantially as set forth.

11. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live-steam and exhaust ports, valves for such ports, shafts mounted in the chest and coupled with such valves and each projecting through the chest, two cranks respectively connected with the projecting ends of the valve-shafts, an upright adjacent to the cylinder, and links connecting the cranks with the upright, substantially as set forth.

12. In an oscillating engine, the combination, with a cylinder, of a steam-chest provided with live-steam and exhaust ports and with curved valve-seats intersected by such ports, valves shaped to fit such seats, which are rocked under them with the cylinder, and means for holding the valves when the cylinder is so rocked, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK L. WHEELER.

Witnesses:

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E. M. LEWIS.