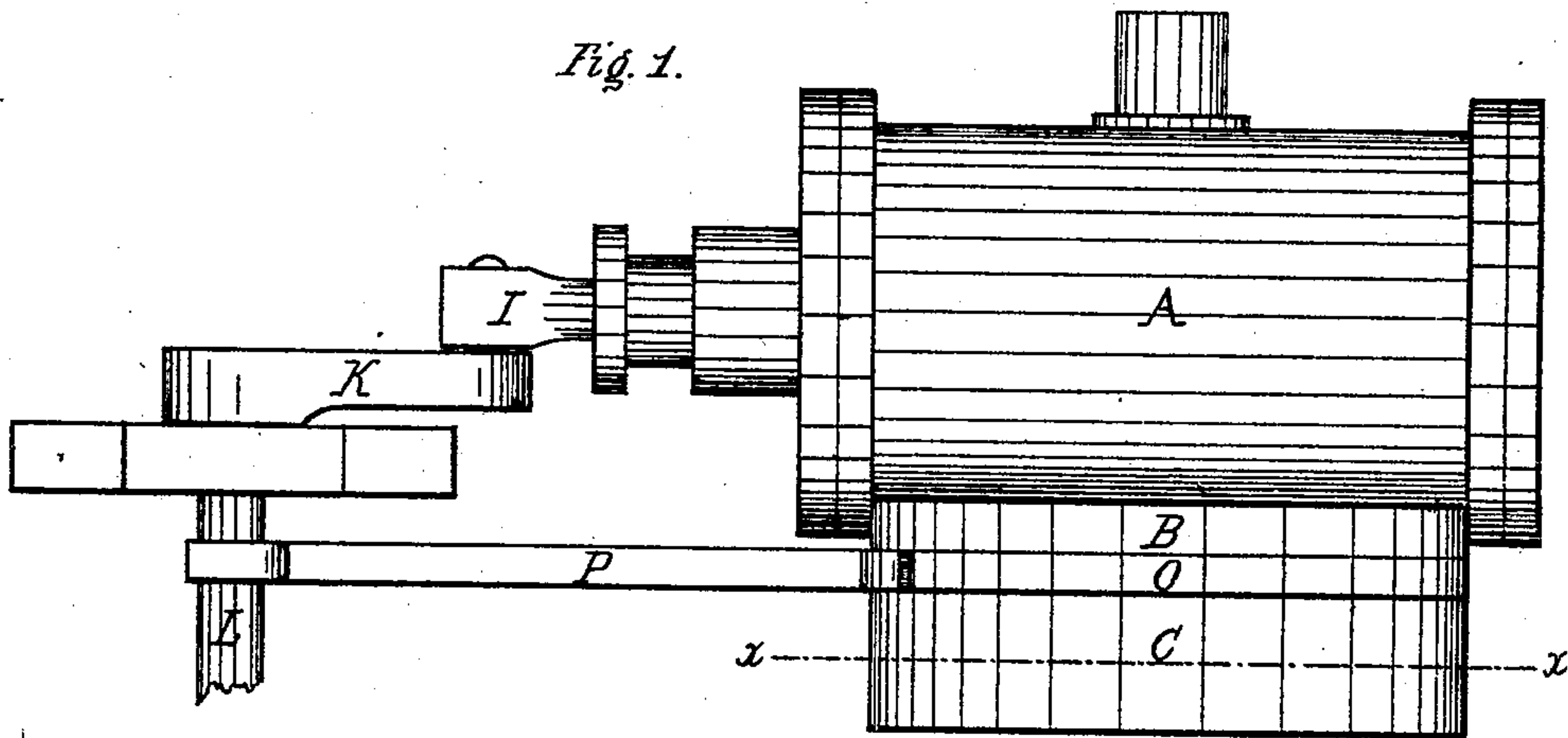
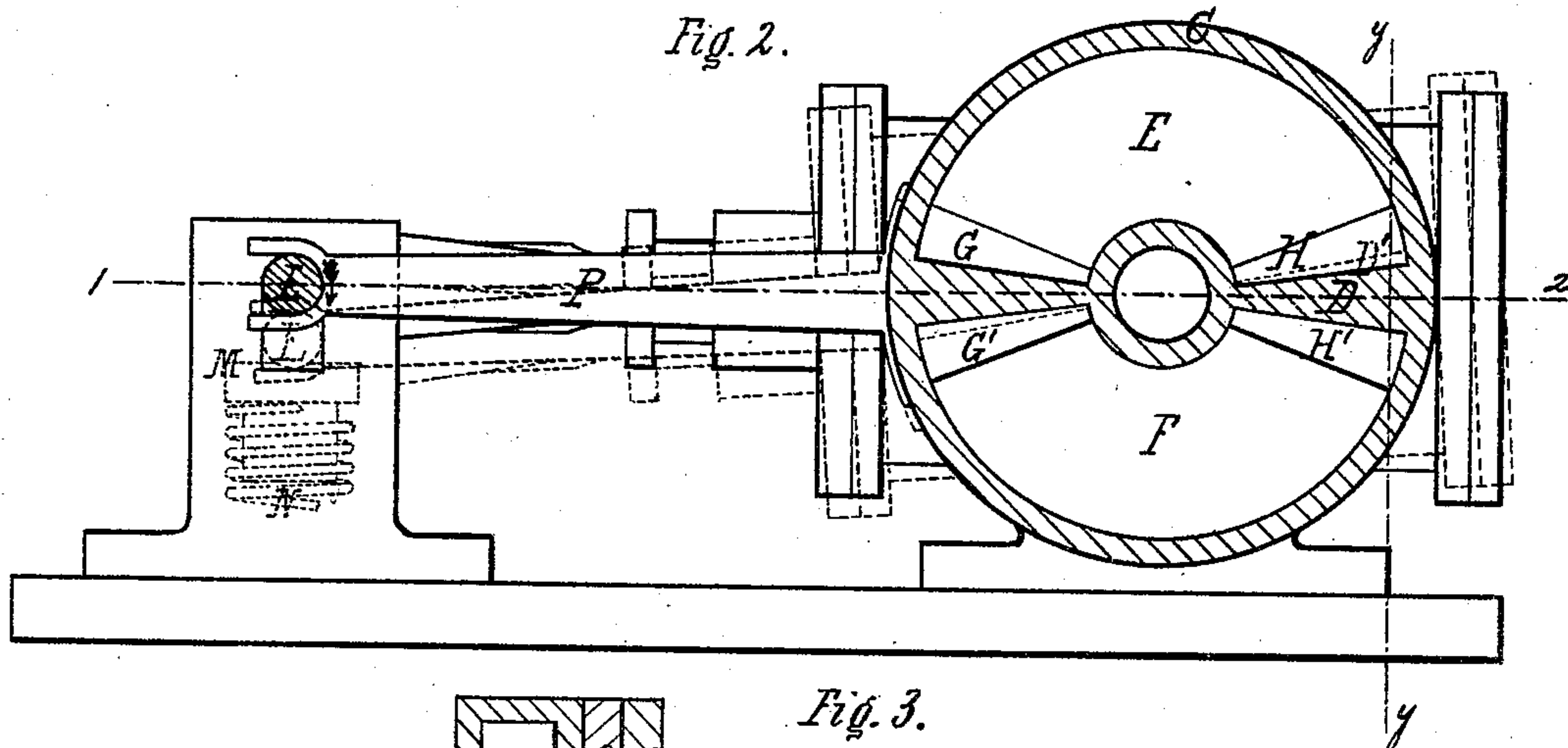


L. GRISCOM.  
Improvement in Oscillating Engines.  
No. 130,988. Patented Sep. 3, 1872.

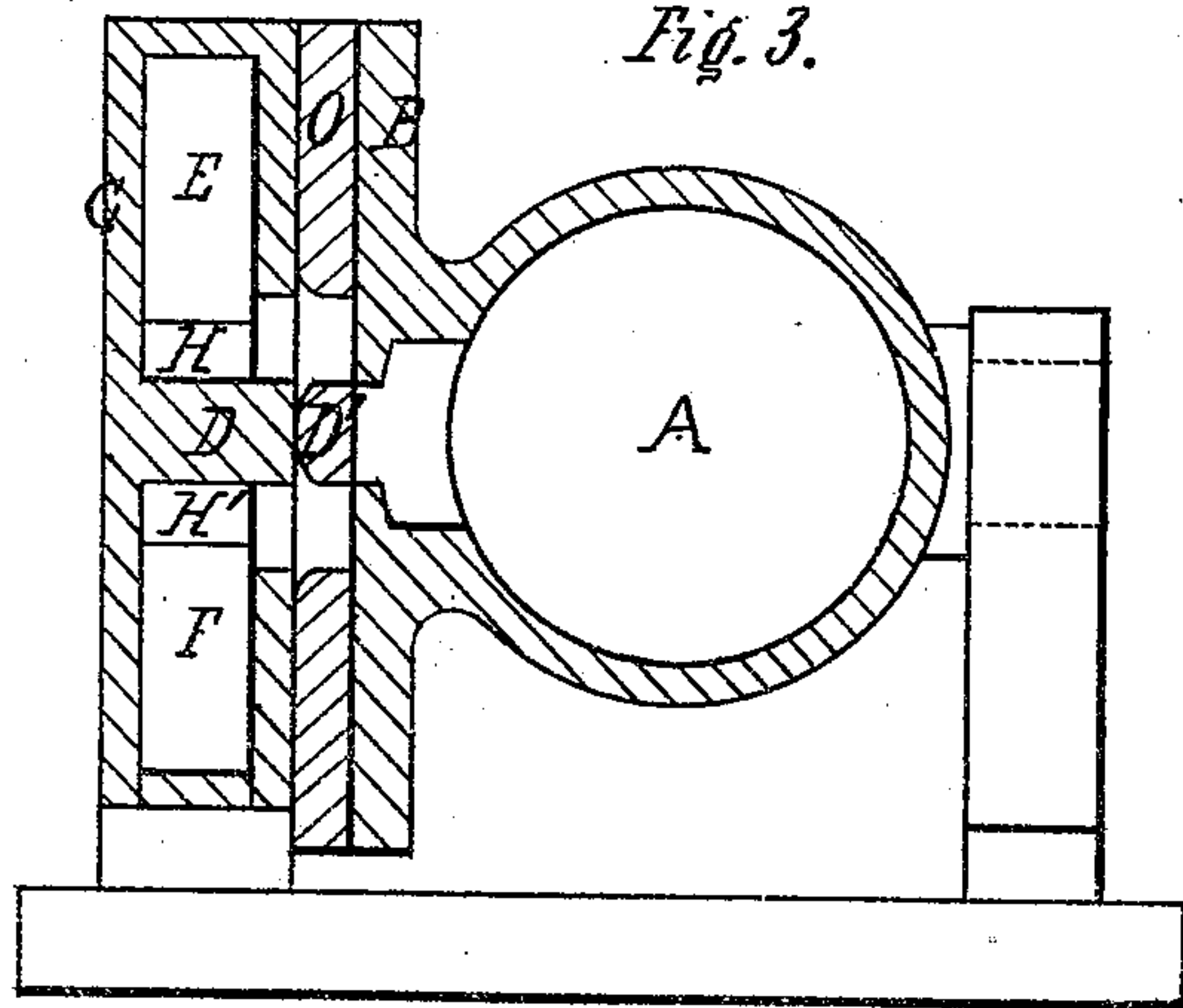
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses:  
Chas. R. Wright.  
Thos. A. Burr.

Inventor.  
Lewis Griscom,  
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Horace Binney, Jr.



# UNITED STATES PATENT OFFICE.

LEWIS GRISCOM, OF PORT CARBON, PENNSYLVANIA.

## IMPROVEMENT IN OSCILLATING ENGINES.

Specification forming part of Letters Patent No. 130,988, dated September 3, 1872.

*To all whom it may concern:*

Be it known that I, LEWIS GRISCOM, of Port Carbon, in the county of Schuylkill and State of Pennsylvania, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the said improvement, reference being had to the accompanying drawing which forms a part of this specification and in which—

Figure 1 is a plan or top view of the said improvement; Fig. 2, a longitudinal section thereof taken on the line *x x*, Fig. 1; and Fig. 3, a transverse section thereof taken on the line *y y*, Fig. 2.

The same parts are denoted by the same letters in all the figures.

This invention relates to that class of steam-engines known as sliding-faced oscillating engines—*i. e.*, oscillating engines in which the valve is rigidly connected with the cylinder, so that the admission and exhaustion of the steam are effected by the oscillation of the cylinder alone, without the intervention of eccentric or cam movements, or other similar devices. In engines of this class a deviation of the crank-shaft from its normal position causes a movement of the cylinder which is independent of the rotation of the crank. In a horizontal engine—for example, the rising or falling of the shaft above or below the true central line of the engine will, through the intervention of the crank and piston-rod, give the cylinder a motion which deranges the admission and exhaustion of the steam, opening or closing the ports improperly when the engine is on or near the centers, and contracting the port-openings when the piston is at or near the half-stroke. This inconvenience is especially serious in locomotive-engines, in which the rise and fall of the driving-axles, caused by the inequalities in the road, weakening and settling of springs, &c., have hitherto rendered the use of this class of engines impracticable. To obviate this difficulty is the object of my invention, which consists in combining with a sliding-faced oscillating engine an equalizing-plate, which prevents the opening or closing of the ports by such movement of the crank-shaft, and also in making the ports of said equalizing-plate of

such shape as to prevent the said movement from reducing the port-openings.

A in the drawing represents the cylinder of an oscillating engine; B, the valve; and C, the steam-chest, divided by the diaphragm or partition D into two compartments, E and F, in each of which are two ports, as shown in Fig. 2, where G and H represent the upper ports, and G' and H' the lower. I is the piston-rod; K, the crank; and L the driving-axle or main shaft, whose bearing, M, (shown in Fig. 2 in dotted lines, indicating its depressed position,) rests on a spring, N, which permits the shaft to rise above or fall below its normal position, shown in full lines in Fig. 2. The valve B is in one piece with the cylinder, or rigidly attached thereto, and communicates with the interior thereof by two ports whose outer openings correspond in size and shape with the ports of the steam-chest. In the drawing these openings are shown as covered by the partition D, the engine being on the center. Supposing the compartment E to communicate with the steam-pipe, and F with the exhaust, so that the revolution of the crank shall be in the direction indicated by the arrow; if, now, (the engine being in the position shown in the drawing,) the crank-shaft should, from any cause, fall below the central line 1—2, the cylinder will be thereby turned, as shown in dotted lines in Fig. 2, which would partially uncover the valve-ports and admit steam prematurely to the cylinder from port H of the steam-chest; or, if the shaft should be raised above the central line, the admission would be correspondingly delayed. To counteract such movement I interpose between the valve and steam-chest an equalizing-plate, O, in which are four ports, whose openings are equal and similar to those of the ports of the steam-chest, and coincident therewith when the crank-shaft is in its normal position. The two upper ports are separated from the two lower ones by the partition D'. An arm, P, attached at one end to the equalizing-plate, and embracing the shaft with the other, communicates to the plate O any variation in the position of the shaft. The engine being in the position shown in the drawing, when the shaft falls, as indicated in dotted lines, Fig. 2, the equalizing-plate is thereby turned to the same extent as the cylinder; and the partition D', which, in this position of the



engine, is covering the valve-ports, continues to cover them as they turn, thereby keeping them closed against the ports of the steam-chest and preventing admission of steam from port H until the valve-port is opened by the rotation of the crank. The converse effect will be produced if the shaft rises above the line 1—2. It is evident that the above-described movements of the shaft will, when the ports are fully open, have the effect of contracting their openings, the passage of the live steam from the steam-chest to the valve and of the exhaust steam in the contrary direction being obstructed by the corners of the ports of plate O whenever the shaft rises above or falls below the line 1—2. To diminish this obstruction as much as possible I bevel or round off the edges of the ports of the equalizing-plate on the face next the steam-chest, as shown in Fig. 3, making the height of the bevel equal to the extent of movement of the port caused by the rise or fall of the shaft.

I do not confine myself to the precise arrangement of mechanism which I have shown

and described, as this may obviously be varied without departing from the principle of my invention. The sliding faces may, for example, be underneath the cylinder or on the end thereof, and other variations of detail will readily suggest themselves.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a sliding-faced oscillating engine, of an equalizing-plate, operating, substantially as described, to prevent the deviations of the crank-shaft from opening or closing the ports.

2. The combination, with a sliding-faced oscillating engine, of an equalizing-plate, whose ports are beveled or rounded on the face next the steam-chest, substantially as described, to prevent the deviation of the crank-shaft from contracting the port-openings.

LEWIS GRISCOM.

Witnesses:

LEONARD MERTZ,  
JOHN L. SHISSLER.