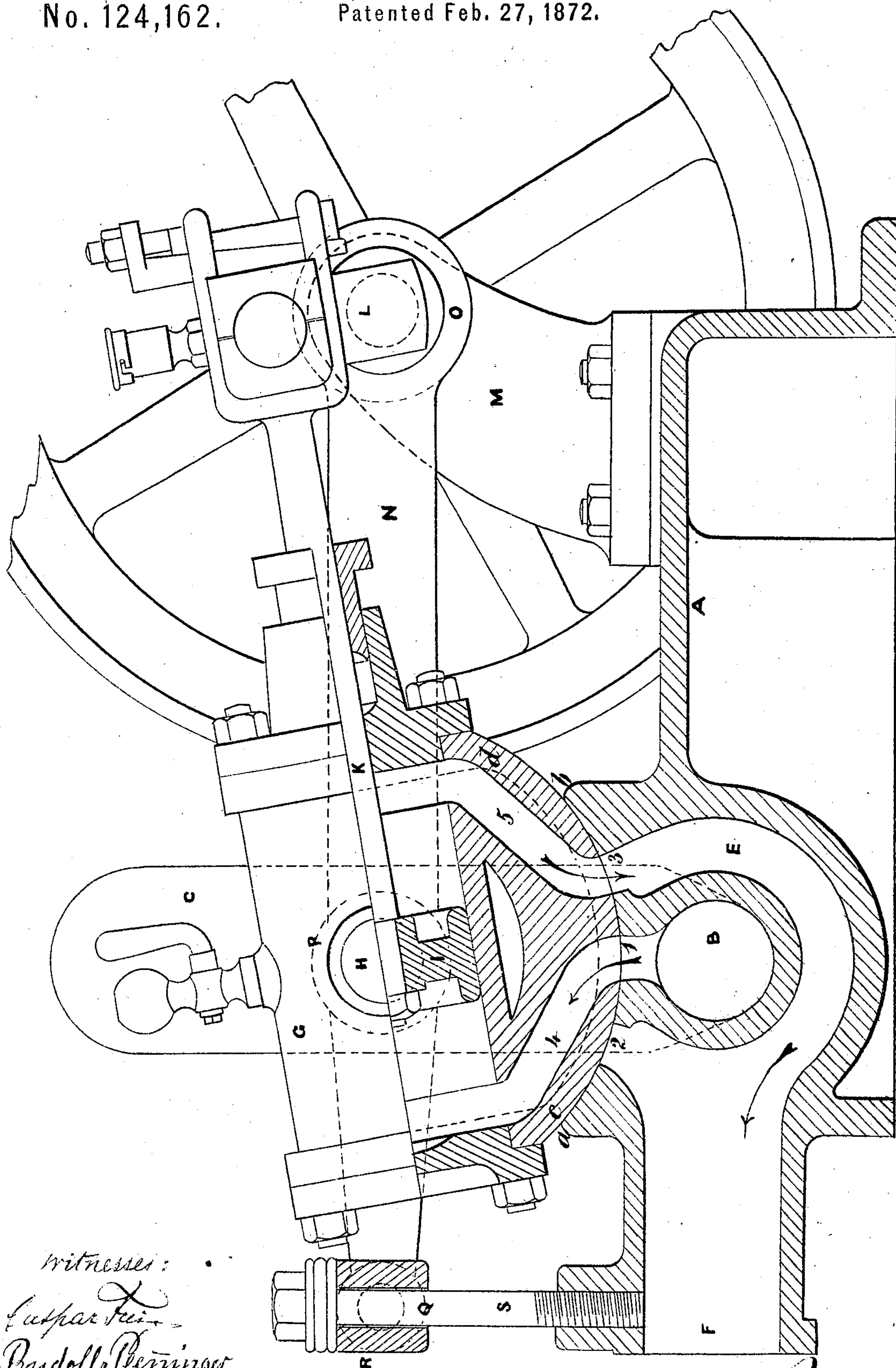


A. SCHMID.
Improvement in Oscillating Engines.
No. 124,162. Patented Feb. 27, 1872.



Witnesses:
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IMPROVEMENT IN OSCILLATING ENGINES.

Specification forming part of Letters Patent No. 124,162, dated February 27, 1872.

SPECIFICATION.

I, ALBERT SCHMID, of Zurich, Switzerland, engineer, have invented Improvements in Motive-Power Engines, applicable also to the raising and forcing of fluids, of which the following is a specification:

This invention relates to that class of engines in which there is an oscillating cylinder moving on trunnions, and formed with a convex curved slide-face, the curve of which is struck from the center line of the trunnions, and forms the segment of a cylinder; this curved slide-face resting and fitting accurately upon a corresponding stationary concave supporting-surface, which also forms a segment of a hollow cylinder, and contains three ports or openings communicating alternately with two ports or passages cast in the convex curved slide-face on the cylinder during the oscillation or rocking of the latter, the said two ports opening into the opposite ends of the said cylinder. This invention consists in coupling the cylinder-trunnions to the crank-shaft or its bearings by connecting rods or levers, as hereinafter described, and also in connecting these rods or levers at their opposite ends to a cross-head, and holding them down by an adjusting screw or screws screwed into the foundation-plate in order to maintain an easy but light junction between the convex and concave rubbing-surfaces. A fly-wheel is provided, and driving-pulleys are mounted upon the crank-shaft, so that the engine may be enabled either to transmit its power to any other machinery, or to be driven by external power, according as it is to be used as a prime mover or as a pump.

And in order that the said invention may be fully understood, I shall now proceed more particularly to describe the same, and for that purpose shall refer to the annexed drawing, which represents a side elevation and partial longitudinal section of the improved motive-power engine or pump.

A is the cast-iron bed-plate, upon which the entire engine is mounted. Across this bed-plate, near one end thereof, there is cast the concave curved face *ab*, forming a segment of a hollow cylinder, in which are formed the three ports 1 2 3. The center port 1 commu-

nicates directly with a central chamber, B, one end of which may closed, or may, if desired, open into an air-vessel, C, when worked as a pump, the chamber B being, in that case, used as the outlet for the fluid. The opposite end of this central chamber B communicates with a pipe, which, in the case of a motive-power engine, is the inlet-pipe, and leads either to a steam-generator, to a head of water, or to a compressed-air reservoir, according as the engine is intended to be driven by steam, hydraulic power, or air. Round the exterior of the central chamber B there is cast another chamber, E, with which the two ports 2 and 3 communicate direct, and to which is cast the branch or nozzle F, forming the exhaust or eduction pipe of the motive-power engine, or the suction-pipe of the pump, as the case may be. G is the working-cylinder or pump-barrel, having cast upon the under side thereof the convex curved slide-face *cd*, forming a segment of a cylinder of the same diameter as the hollow cylinder, of which the surface *ab* also forms a segment. The axis of the imaginary cylinder, of which these two surfaces *ab* and *cd* form a part, is situated transversely to the axis of the main working-cylinder G, and forms, in fact, the axial center line of the two trunnions H H, on which the cylinder oscillates, as hereinafter described. The two rubbing-surfaces are, of course, made smooth and true, as is well understood, so that when the slide-face *cd* rests upon the face *ab*, it will form a tight junction therewith, and still be free to slide or work easily thereon. In the convex curved slide-face *cd* there are cast two passages, 4 and 5, of equal length, leading to opposite ends of the cylinder, the distance between the ports or orifices of such passages corresponding exactly with the distance between either two adjoining ports, 1 2 or 1 3, in the concave face *ab*. The piston I is connected directly by its rod K to the crank on the crank-shaft L, which works in bearings formed in brackets M bolted to the bed-plate, and consequently, as the shaft rotates, the cylinder G receives an oscillating motion on the axis of its two trunnions.

In order to couple or tie the cylinder to the crank-shaft, two side levers, N N, are employed, provided with suitable eyes, O O, which are

slipped onto the bearings of the main shaft L, and also with other eyes, P P, which are slipped over the trunnions. These side levers are extended beyond the trunnions, and are provided with eyes Q Q, which fit onto the ends of a cross-head, R, carried on a central pillar or support, S, screwed into the main casting of the engine. The upper end of this pillar S has a head, e, formed thereon above the cross-head, so that on screwing down the pillar S the cross-head, with the ends of the two side levers, will be depressed, and the curved slide-face *c d* brought into closer contact with the port-face *a b*; thus, by properly adjusting the pillar S, an easy but light junction between the two curved rubbing-surfaces may be constantly maintained, and any wear or tear thereof compensated for. The pressure between the two rubbing-surfaces is perfectly independent of the fluid pressure in the cylinder, it being regulated solely by the adjusting-pillar S.

What I claim as my invention in a motive-power engine or pump of the construction herein referred to is—

1. The combination, with the working cylinder or barrel provided with a convex curved slide-face containing two ports and passages communicating with opposite ends of the cylinder, and supported and working on a corresponding concave port-face, as described, of side levers or rods which couple the cylinder-trunnions to the crank-shaft or its bearing, substantially as herein shown and described.

2. The combination, with the side levers or rods, of the means, substantially such as described, for pressing said levers upon the cylinder-trunnions in order to maintain a tight junction between the curved rubbing-surfaces of the cylinder and its bed, substantially as shown and set forth.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT SCHMID.

Witnesses:

CASPAR FREI,
RUDOLPH PFENINGER.