

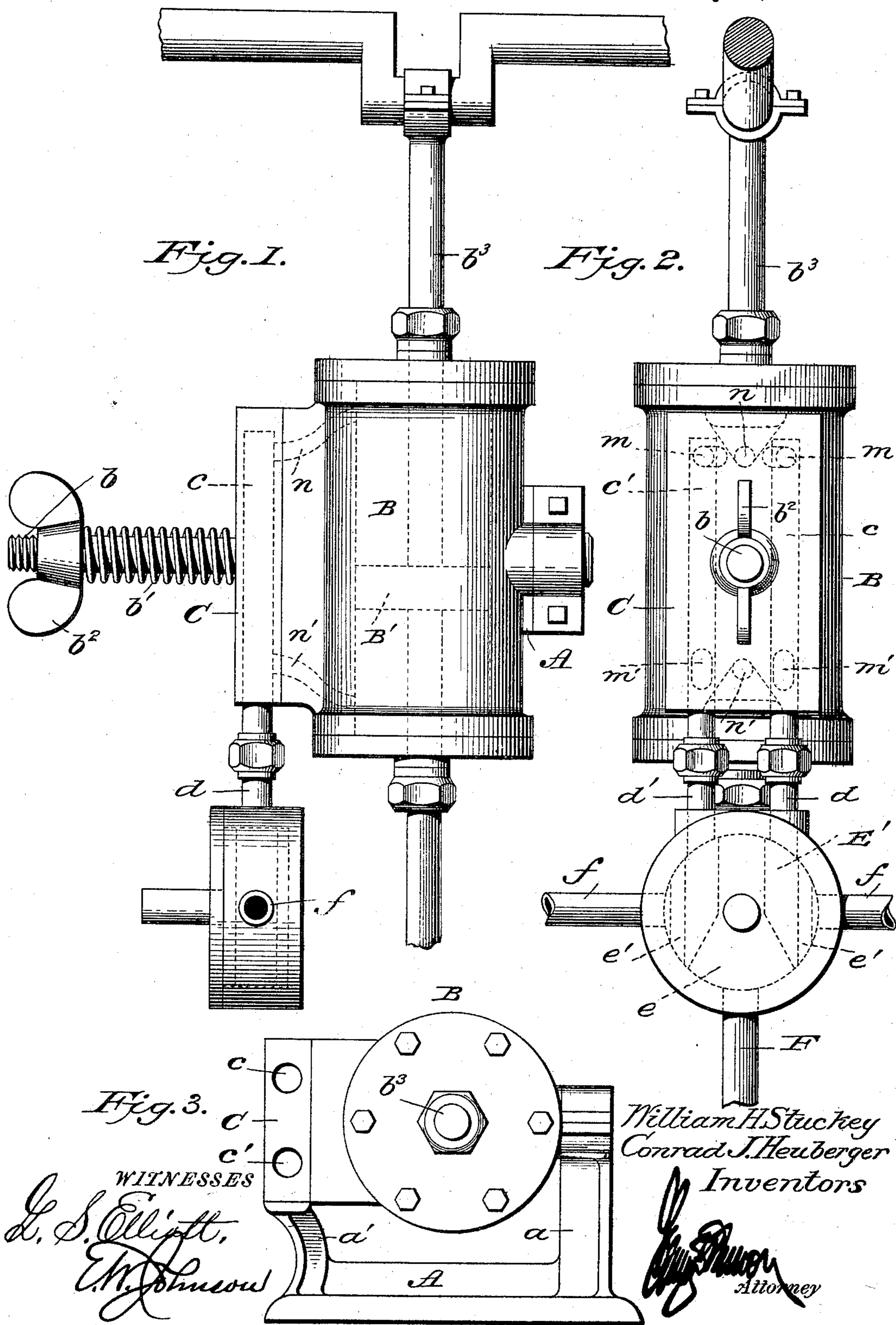
(No Model.)

2 Sheets—Sheet 1.

W. H. STUCKEY & C. J. HEUBERGER.
OSCILLATING STEAM ENGINE.

No. 586,069.

Patented July 6, 1897.



William H. Stuckey
Conrad J. Heuberger
Inventors

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Attorney

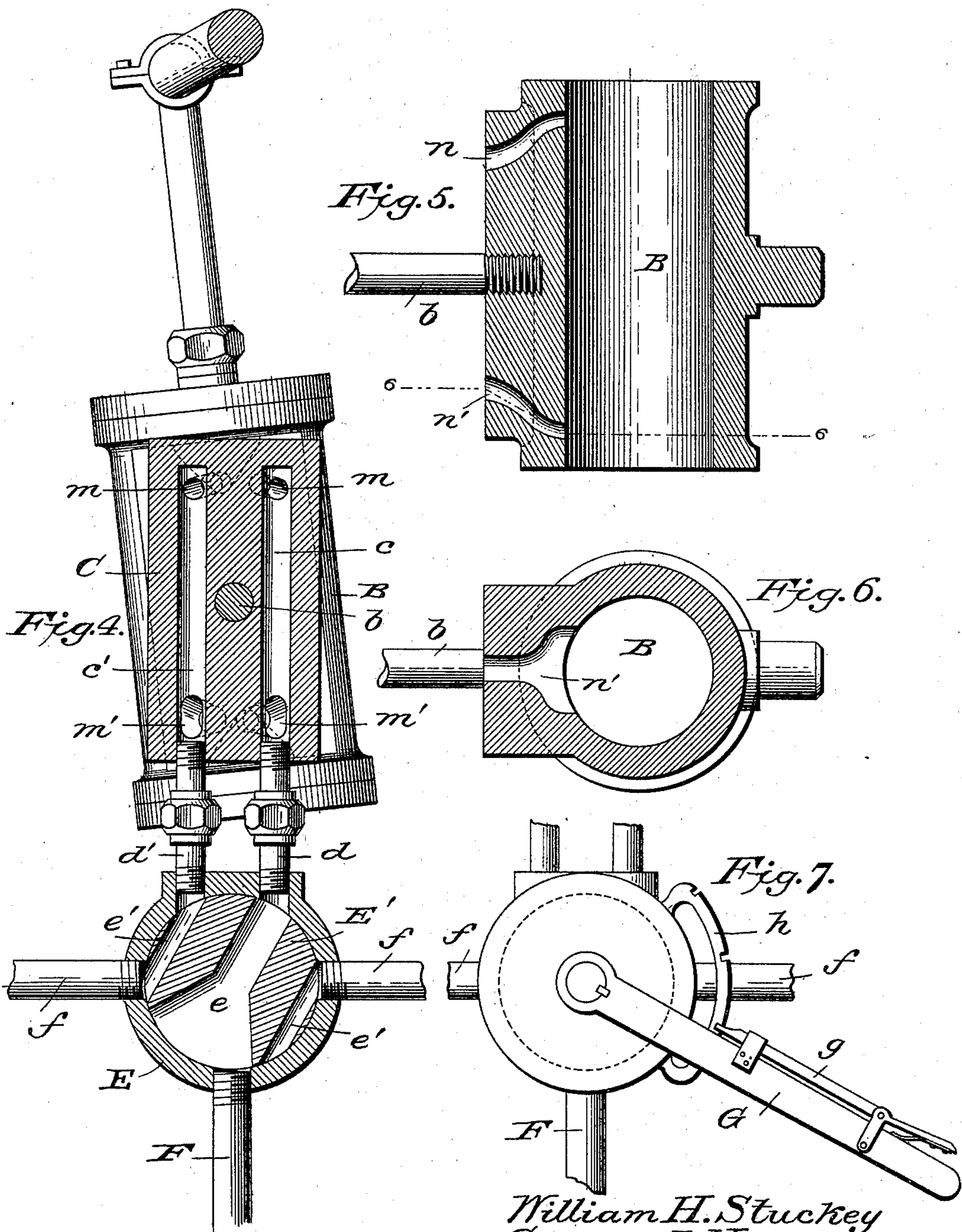
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WITNESSES

L. S. Elliott.
T. M. Johnson

William H. Stuckey
Conrad J. Heubeger
INVENTORS

by *[Signature]* Attorney

UNITED STATES PATENT OFFICE.

WILLIAM H. STUCKEY AND CONRAD J. HEUBERGER, OF LYKENS, OHIO.

OSCILLATING STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 586,069, dated July 6, 1897.

Application filed May 7, 1896. Serial No. 590,571. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. STUCKEY and CONRAD J. HEUBERGER, citizens of the United States of America, residing at Lykens, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Oscillating Steam-Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in oscillating engines; and it consists in the construction and combination of the parts, including the novel construction of the steam-chest, ports, means for supporting the engine, and in the construction of the rotary valve, all as will be hereinafter fully set forth, and particularly pointed out in the claim.

In the accompanying drawings, forming part of this specification, Figures 1 and 2 are side elevations of an oscillating engine constructed in accordance with our invention. Fig. 3 is an end elevation showing the manner of connecting the cylinder to its supporting-frame, in which it oscillates. Fig. 4 is a side elevation, partly in section. Fig. 5 is a sectional view of the cylinder. Fig. 6 is a sectional view on the line 6 6 of Fig. 5. Fig. 7 is a side elevation of the valve-casing, including the lever for operating the rotary valve.

A designates a rigid base-frame having at one side an upright *a*, the upper end of which is recessed and provided with a cap to form a bearing for one of the trunnions of the cylinder B, and on the opposite side of said base-frame is a shorter standard *a'*, to which the steam-chest C of the engine is rigidly attached. The other trunnion *b* of the cylinder is of considerable length to pass through the steam-chest and beyond the same to receive a tension-spring *b'*, which insures a close fit of the contacting surfaces of the parts B and C, said trunnion *b* having a threaded end to receive a thumb-nut *b²*, by which the tension of the spring *b'* can be regulated. This arrangement permits the cylinder B to oscillate inde-

pendent of the steam-chest C, and also provides for a tight joint between said parts, as hereinbefore stated.

The cylinder B is provided with the usual piston B' and piston-rod *b³*, the latter being connected at its outer end to the main crank-shaft of the engine, as shown in the drawings, and when the engine is in operation the movement of the piston through its connection with the crank-shaft will oscillate the cylinder upon its trunnions to bring the ports in their proper position to supply the steam to said cylinder on one side of the piston and exhaust from the other side, said ports and passages leading thereto being constructed and arranged as hereinafter described.

The steam-chest C is provided with two longitudinal passages or ways *c* and *c'*, which are connected to pipes *d* and *d'*, leading to a valve-casing E, inclosing a valve E', which governs the supply and exhaust of the steam through said passages or ways. The passages or ways *c* and *c'* communicate with ports *m m* and *m' m'*, which extend through the steam-chest and are adapted to register with ports *n* and *n'* in the cylinder. The passages or ways *c* and *c'* are located such a distance from each other that in order to insure the registering of the ports *m* and *m'* with the ports *n* and *n'* the first-mentioned ports converge, as shown in Figs. 2 and 4, while the ports in the cylinder are centrally located, so that the oscillation of said cylinder will cause said ports to alternately register with the ports in the steam-chest. It will be understood that when one of the ports in the cylinder registers with a port leading to the passage or way *c* the other port of said cylinder registers with a port leading to the passage or way *c'*, as one of said passages or ways forms the steam-supply, while the other forms the exhaust, according to the position of the rotary valve E'.

The ports *n* and *n'* are curved, as shown in Fig. 5, so as to enter the cylinder nearer the ends thereof, and said ports are also spread, as shown in Fig. 7, to provide for the free expansion of the steam.

The rotary valve E' is provided with a main opening or way *e*, into which the live steam passes from the supply-pipe F, and on each side of said main opening or way is an opening or way *e'*, which communicates with the

exhaust-pipes *ff*. By this arrangement when the main opening or way in the valve is in communication with the pipe *d* the way *e'* on one side of the same will connect the pipe *d'* with one of the exhaust-pipes *f*, and when said valve is turned to supply live steam to the pipe *d'* the other opening *e'* will connect the pipe *d* with the other exhaust-pipe *f*. When the valve is turned so that the opening or way *e* is positioned between the pipes *d* and *d'*, the supply of live steam to the steam-chest will be entirely cut off. The rotary valve is provided with an operating-lever *G*, having the ordinary sliding dog *g*, which engages notches in a segment *h*, attached to the valve-casing, and said notches, in connection with the sliding dog on the lever, determine the position of the valve with respect to the pipes *d* and *d'*.

From the foregoing description, in connection with the drawings, the operation of the engine will be readily understood, for when the parts are in the position shown in Fig. 4 the steam will be supplied to the cylinder through the way *c* and ports *m'* and *n'*, the exhaust from the other side of the piston being through the ports *n* and *m* and way *c'* to the exhaust-passage *e'* in the rotary valve, and the oscillation of the cylinder will bring the ports *n* and *n'* alternately in communication with the ports *m* and *m'*.

We are aware that prior to our invention an oscillating engine has been devised to present a stationary steam-chest having parallel steam-passages with ways which alternately register with ports in the oscillating cylinder, as shown in the patents of Adam H. Hafley, No. 314,932, and Albert L. Dewey, No. 116,031; also, that the reversing-valve which we employ is not new. We do not therefore claim

such parts, broadly, as our invention, but limit our claims to the particular construction shown and described.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In an oscillating steam-engine, the combination with the base *A*, carrying on one side a stationary steam-chest *C*, and opposite thereto a standard *a* formed with a bearing at its upper end, the steam-chest having an aperture through the same opposite said bearing said steam-chest having parallel passages *c c* one on each side of the opening or aperture and converging ports *m m'*; a cylinder *B*, having a short trunnion which is journaled in the bearing at the upper end of the standard *a* and a long trunnion the ends thereof being threaded one end for engagement with an internally-threaded aperture in the cylinder, a helical spring *b'* which encircles the projecting end of the trunnion *b* so as to bear upon the steam-chest, a thumb-nut carried by the outer end of the trunnion and engaging with the spring, the cylinder having curved ports *n n'* the inner portions of said ports being extended; together with a turning valve mounted in a rigidly-supported casing and pipes *d d'* which connect the casing with the passages *c c* in the steam-chest, the parts being organized substantially as shown and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. STUCKEY.
CONRAD J. HEUBERGER.

Witnesses:

A. J. RICHARDS,
J. T. CARBIN.