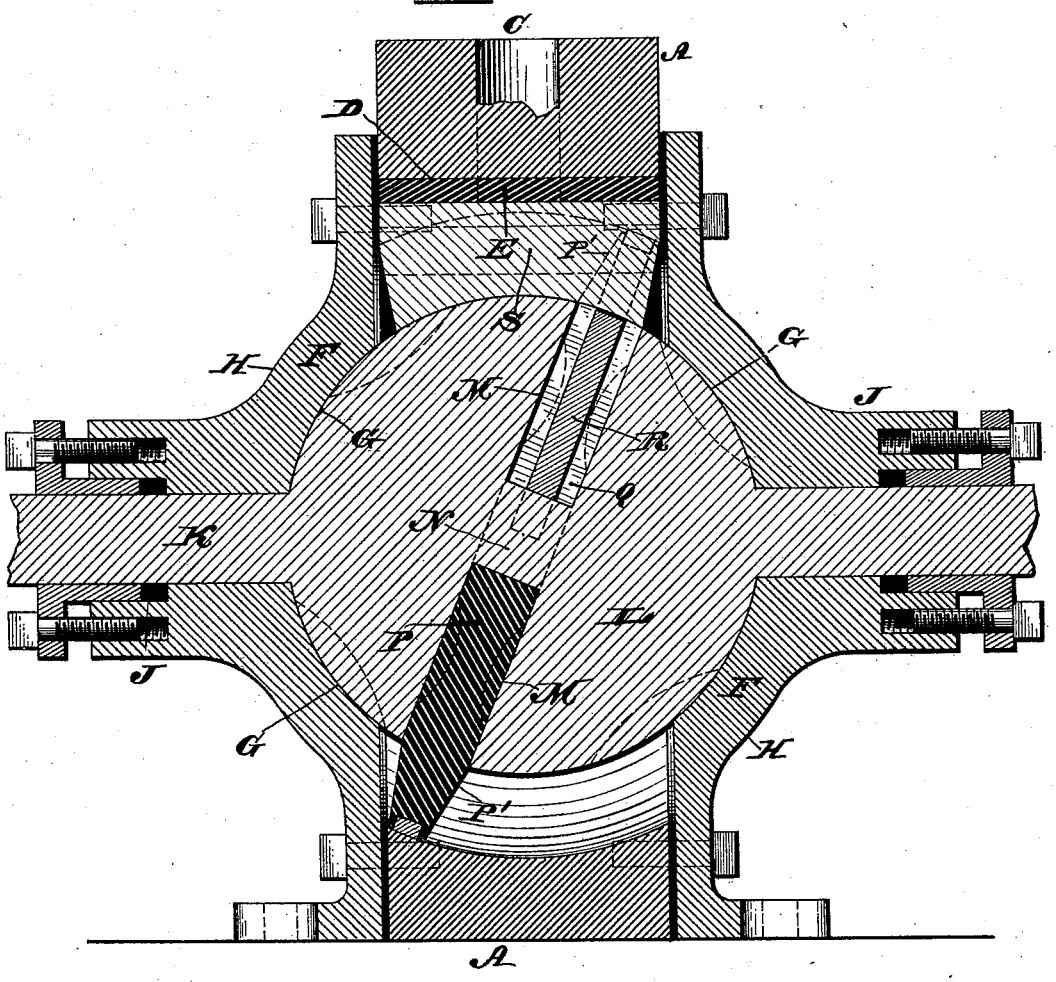
(No Model.) 3 Sheets—Sheet 1.

A. C. AHLSTRÖM.

STEAM ENGINE.

No. 422,328. Patented Feb. 25, 1890.

Fig. 1.



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O. F. Lagle

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(No Model.) 3 Sheets—Sheet 2.

A. C. AHLSTRÖM.

STEAM ENGINE.

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Fig. 2.

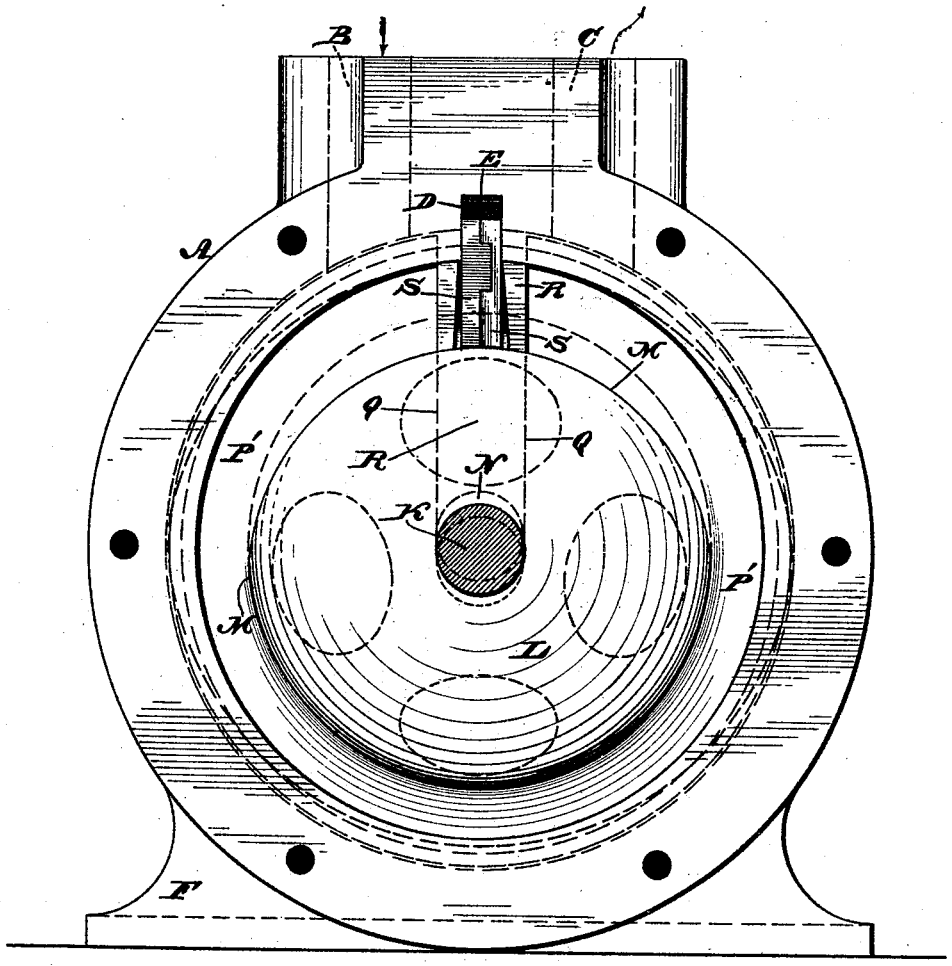


Fig. 6.

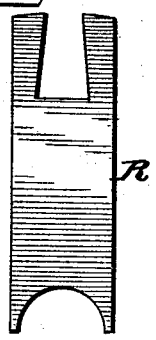
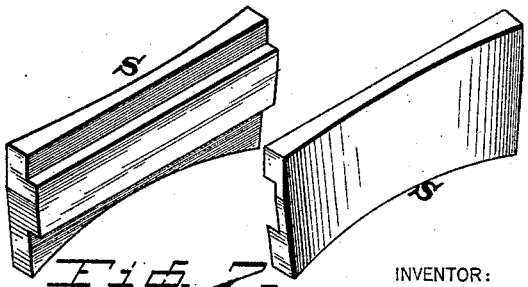


Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

A. C. AHLSTRÖM.

STEAM ENGINE.

No. 422,328. Patented Feb. 25, 1890.

Fig. 3.

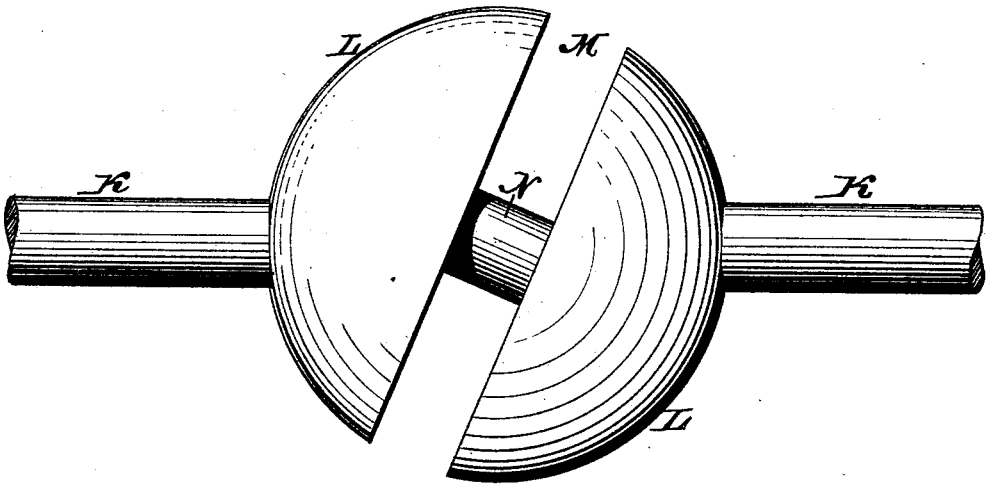
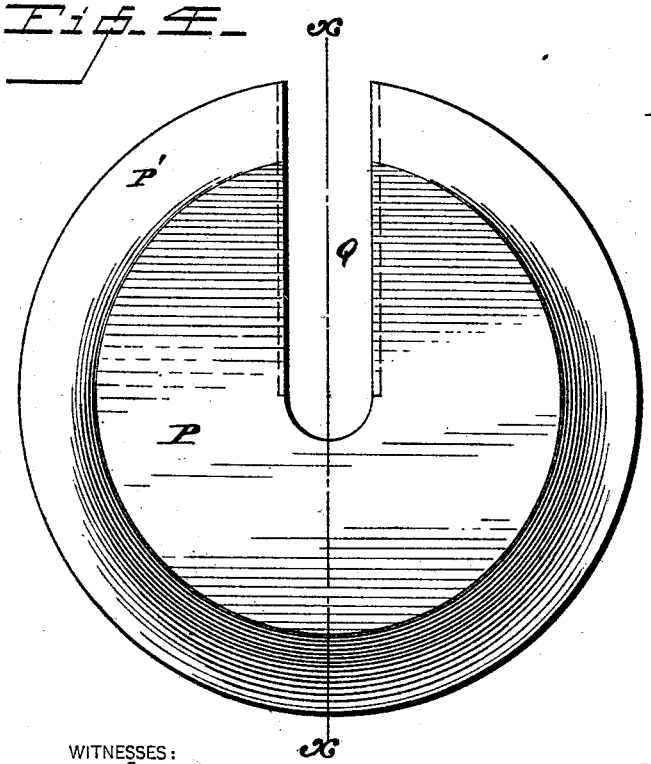


Fig. 4.



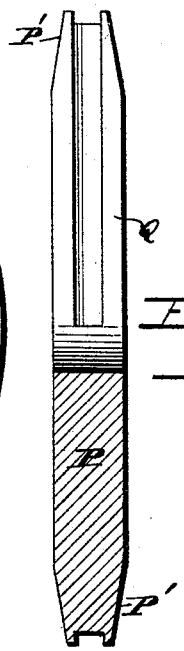


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALFRED C. AHLSTRÖM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CHRISTOPH SCHNEIDER AND HENRY GIANELLA, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 422,328, dated February 25, 1890.

Application filed September 27, 1889. Serial No. 325,308. (No model.)

To all whom it may concern:

Be it known that I, ALFRED C. AHLSTRÖM, a subject of the King of Sweden, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Steam-Engines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to steam-engines; and it primarily consists of a rotary driving-shaft having a centrally-located ball with groove and an inclined crank, an oscillating disk-piston mounted on said crank, and means, substantially as described, for keeping said piston in position.

The invention consists, secondarily, of details of construction and arrangement of the parts, as will be more fully hereinafter set forth.

Figure 1 represents a vertical section of an engine, showing my invention. Fig. 2 represents an elevation with one of the heads removed. Fig. 3 represents a detail view of the shaft, ball, and crank. Fig. 4 represents an elevation of the piston-disk. Fig. 5 represents a section on line *x x* of Fig. 4. Fig. 6 represents a detail view of the key. Fig. 7 represents a detail view of the valve-plate.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the shell or casing, having ingress and exhaust ports B and C and a groove D, to receive a key E, for a purpose hereinafter stated. Heads F are secured to the shell or casing A, and are formed with inner concave recesses G, with outer convex swells H, and outer collars J, to provide bearings for the drive-shaft K, the said collars being constructed to receive suitable packing or stuffing boxes. In lieu of the heads F, the shell or casing may be made in sections, as desired. The shaft K is constructed with a centrally-located ball L, having a circumferential groove M therein at an angle to the shaft K and surrounding a crank N at right angles to the said groove M.

P designates the piston, formed of a disk having a beveled edge P′, and a slot Q to be slipped over crank N, and allow the said disk to bear within the groove M, and is held in tact therewith by a bifurcated key R, removably driven within the slot Q against the crank N. The key R is constructed in the manner set forth, for the purpose of allowing movement thereof over a valve-plate S, Fig. 7, the outer enlarged end of the same being mounted in groove D in the shell A against key E. The inner reduced end of said plate S is concaved and fits over the ball L, and the sides of said plate are concaved to form an easy bearing on the legs of key R. The plate S is located between the ports B and C, and is radially arranged relatively to the shaft K, thereby dividing half of the interior of the shell or casing A into two passages to permit the steam to have full force on the piston-disk P at the moment of greatest pressure. The interior of the shell or casing A and the circumferential surface of the ball L are concentric, as is also the piston P. The diagonal groove M of the ball normally elevates the piston P at one side and lowers it at the other, and is so arranged as to initially open the ingress-port B and shut off the exhaust-port C. The steam entering port B impacts against the under side of the piston-disk P and gradually elevates and oscillates the same, and the movement of said piston is transmitted through crank N to shaft K, thereby revolving the latter. As the steam continues to elevate the piston P the exhaust-port C is opened for the escape of the said steam. The ball L may be constructed of any preferred diameter, and the size of said ball determines the speed and power of the engine. It will be understood that packing will be inserted between the joints of the parts and in the peripheral edge of piston P.

The engine is adapted for use in any of the mechanical arts, as well as for domestic and other purposes found desirable and applicable.

The valve-plate S may be made in two parts and provided with interior springs to expand the same.

A series of the engines may be placed in tandem or otherwise and the exhaust steam from one be used in the other.

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

1. In a steam-engine, a shell or casing, heads therefor having interior conical surfaces, a shaft having a ball with a groove and a crank, a piston engaging the groove of said ball, a key therefor with a bifurcation to form legs, as set forth, and a valve-plate mounted in the bifurcation of said key and constructed with concave end and sides, substantially as described.

2. In a steam-engine, a sectional shell with the inner concave recesses G, a shaft with centrally-located ball having a circumferential groove, a slotted disk-piston bearing on an inclined crank in said ball, and a bifurcated key in the slot and against the crank, said parts being combined substantially as described.

3. A sectional shell with inner concave recesses and a groove, a shaft with a ball having a circumferential groove and an inner inclined crank, a slotted disk-piston on said crank, a valve-plate in the said groove of the casing, and a key in said slotted disk, said parts being combined substantially as described.

4. In a steam-engine, a sectional shell having concave inner faces and a groove, a rotary shaft with ball having a circumferential groove and an inclined crank, a slotted disk-piston on said crank, a bifurcated key in the slot and against the crank, and valve-plates with enlarged ends mounted in the groove of the shell and against a key E, said parts being combined substantially as described.

5. In a steam-engine, a sectional shell having concave inner faces and a groove, a rotary shaft with grooved ball having an inner inclined crank, a slotted disk on said crank, a key in the slot, and valve-plates mounted in the groove of the shell, said parts being combined substantially as described.

6. A sectional shell having concave inner faces and a groove, a rotary shaft with a grooved ball having an inclined crank, a slotted disk with beveled edges in said groove, a key in the slot and against the crank, and valve-plates in the groove of the shell, said parts being combined substantially as described.

7. In a steam-engine, the combination of a sectional shell or casing having the ports B and C, the shaft K, a grooved ball with disk-piston, a key for said piston, and a valve-plate located between the ports B and C and radially relative to the shaft, substantially as and for the purpose set forth.

8. In a steam-engine, the combination of a sectional casing having the ports B and C and the groove D, a rotary shaft with a grooved ball, a disk-piston and key, a valve-plate with enlarged outer end in the groove D and between the ports and having a reduced inner end fitting on the ball of the rotary shaft, and a key in the said groove, substantially as described.

ALFRED C. AHLSTRÖM.

Witnesses:
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L. JENNINGS.