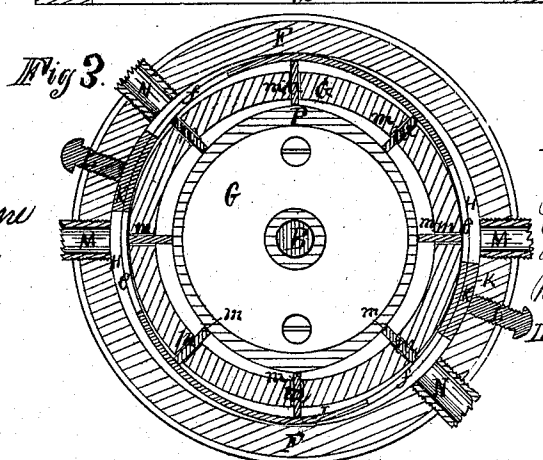
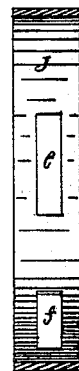
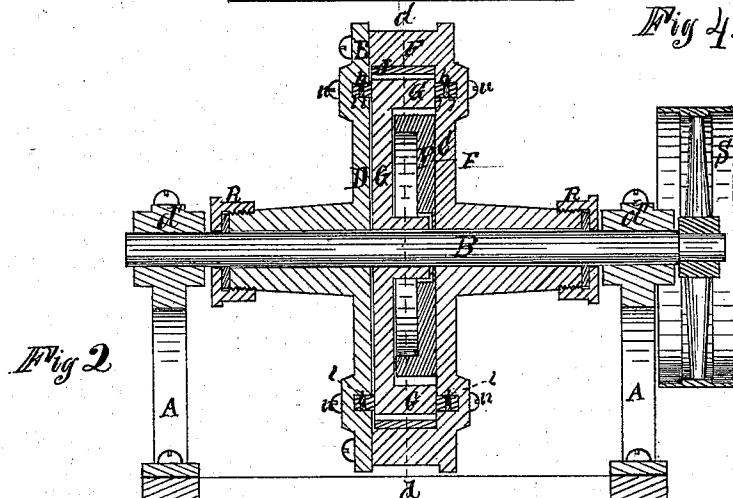
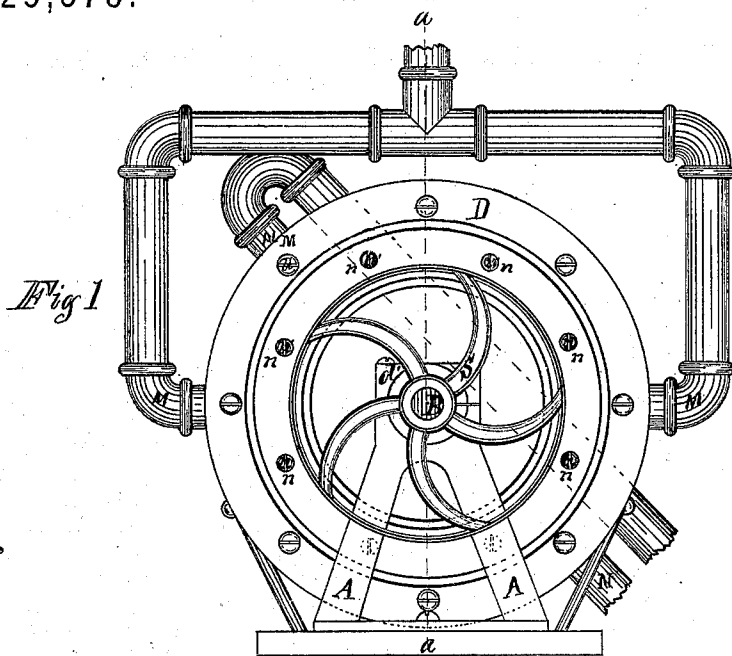


J. J. CLARK & B. CLARK.
Improvement in Rotary Engines.

No. 125,378.

Patented April 9, 1872.



Witnesses
C. H. Sherburne
J. W. Merriam

Inventors
John J. Clark
Byron Clark
By Sherburne & Co.
Attorneys

UNITED STATES PATENT OFFICE.

JOHN J. CLARK AND BYRON CLARK, OF ELGIN, ILLINOIS.

IMPROVEMENT IN ROTARY-ENGINES.

Specification forming part of Letters Patent No. 125,378, dated April 9, 1872.

To all whom it may concern:

Be it known that we, JOHN J. CLARK and BYRON CLARK, of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Rotary Steam-Engines; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which our invention appertains to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is an end elevation of a rotary steam-engine embodying our said improvement. Fig. 2 is a vertical longitudinal central section of the same with pipes removed, showing those parts which are at the right hand of the line *a a* drawn vertically through Fig. 1. Fig. 3 is a vertical transverse section of the cylinder, showing those parts which are at the right hand of the line *d d* drawn vertically across Fig. 2; and Fig. 4 is a vertical central section of the packing-ring employed, showing the ports through which the steam is admitted into and discharged from the cylinder.

Similar letters of reference indicate like parts in the several figures of the drawing.

Our invention has for its object to improve the construction of rotary steam-engines, whereby they are rendered more complete and efficient in their operation than those commonly in use. To this end the invention consists, first, in providing the interior of the cylinder with a wide ring, through which steam-ports are cut at suitable intervals, and adapted to be held outward at opposite points against the inner circumference of the cylinder, and inward against the piston-head at points opposite to each other and between points of contact with the cylinder. By this provision suitable chambers are formed within the cylinder for the movement of the pistons in receiving and discharging the steam. The invention further consists in the means employed for operating the pistons to receive the steam and discharge it from the cylinder, and in the construction and combination of various parts, as we will now proceed to describe.

In the accompanying drawing, A is a metal frame of suitable form and construction to support the operating parts, and B is a horizontal shaft having its bearings in boxes *d'* affixed to

the uprights of the frame. The cylinder of the engine, mounted loosely upon this shaft, and secured firmly to the base of the frame, is composed of a plate, C, provided with a lateral rim, F, and a face-plate, D, bolted to the rim, so as to form a steam-tight joint. The shaft B revolves freely within the cylinder, and the hubs of the latter are provided with stuffing-boxes R to prevent the escape of steam around the shaft. G is the piston-head, mounted upon the shaft B so as to rotate within the cylinder. It is provided at its periphery with a lateral rim, so that it shall fill the width of the cylinder at that point, and is made somewhat smaller in diameter than the cylinder in order to produce an annular chamber, H, between the two. *i i* are metal packing-rings let into the inner faces of the cylinder so as to bear against opposite sides of the piston-head at about the middle of the rim. There are two rings, *i*, in each face of the cylinder, and between them is arranged an elastic packing-ring, *j*. The compound packing thus produced is adjusted to form steam-tight joints between the piston-head and cylinder by means of screws *n* passing laterally through the face-plates of the latter, as shown. J is a metal ring or hoop placed within the chamber H of the cylinder. It is equal in width, or nearly so, to the interior width of the cylinder, and is made in the form of an ellipse, so that its periphery at the two extremities of its major axis shall bear against the inner circumferential surface of the cylinder, and its interior surfaces in the line of its minor axis shall bear against the periphery of the piston-head. The essential requisite of this arrangement is that the latter points of contact shall be located between the former, as shown in Fig. 3. K K are abutments arranged opposite each other, between the rim F of the cylinder and the ring J, and L are set-screws passing through the rim F, by which the abutments are adjusted to secure the proper adjustment of the ring with respect to the cylinder and piston-head. The ring J is further provided with a series of slots or ports, *e f*, communicating respectively with the steam induction-pipes M and the exhaust-pipes N, which pipes M M and N N are arranged to connect with the cylinder upon opposite sides of the shaft B. P is a cam secured to the interior of the cylinder so as to enter the piston-head, and arranged

with its longer axis in line with that of the ring J. The rim of the piston-head is formed with a series of transverse slots, within which are loosely fitted the pistons *m*, whose inner ends rest upon the periphery of the cam, so that as the piston-head is rotated the pistons shall be moved out and in alternately by the cam and ring to receive and discharge the steam.

The operation of the engine is as follows: Steam from the boiler being admitted to the chamber H through the induction-pipes M and ports *e* of the ring J, impinges against the pistons *m*, thereby rotating the piston-head and shaft B. The longer radiuses of the cam P force the pistons outward to receive the steam as the piston-head rotates, while its shorter radiuses allow the compressed sides of the ring to force the pistons inward, and thereby exhaust the steam through the ports *f* and pipes N, as will be readily understood. Motion is communicated from the piston-head to the machinery to be operated by a suitable belt running over a driving-wheel, S, affixed to the shaft B.

Having thus described our invention, what we claim is—

1. The elliptical ring J provided with steam-ports, and arranged within the cylinder of a rotary steam-engine so as to be held outward against the inner circumference of the cylinder at opposite points, and inward against the rotary piston-head at opposite points, substantially as described, for the purpose specified.

2. The elliptical ring J, having steam-ports, combined with sliding pistons in a rotary piston-head, substantially as described, for the purpose specified.

3. In combination with the elliptical port-ring J and the fixed cam P, we claim the piston-head and the sliding pistons *m*, substantially as described, for the purpose specified.

4. The adjustable abutments K in combination with the piston-head and the elliptical ring J, substantially as described, for the purpose specified.

JOHN J. CLARK.
BYRON CLARK.

Witnesses:

D. W. HEWETT,
JOHN W. RANSTEAD.