No. 607,085. Patented July 12, 1898.

C. ROUX.

ROTARY ENGINE.

(Application filed Oct. 14, 1897.)

(No Model.)

Fig. 7.

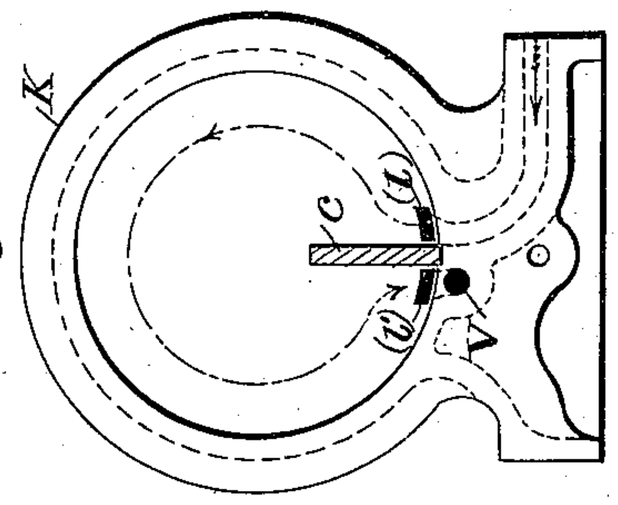


Fig. 3.

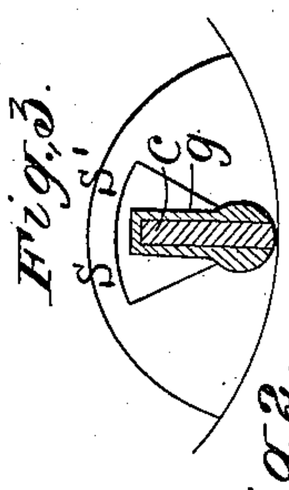


Fig. 2.

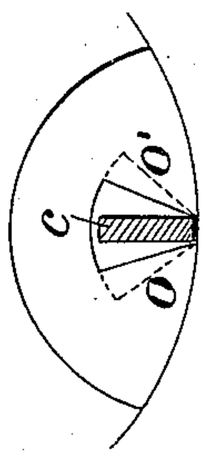


Fig. 4.

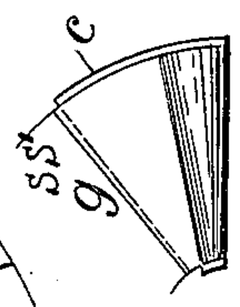


Fig. 5.

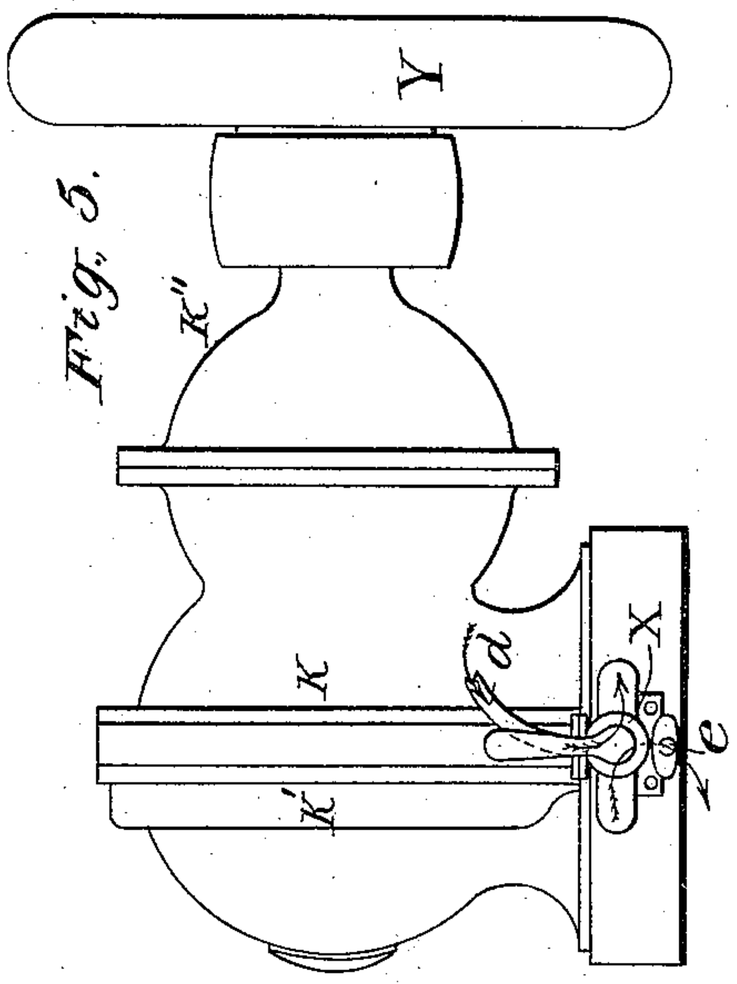


Fig. 1.

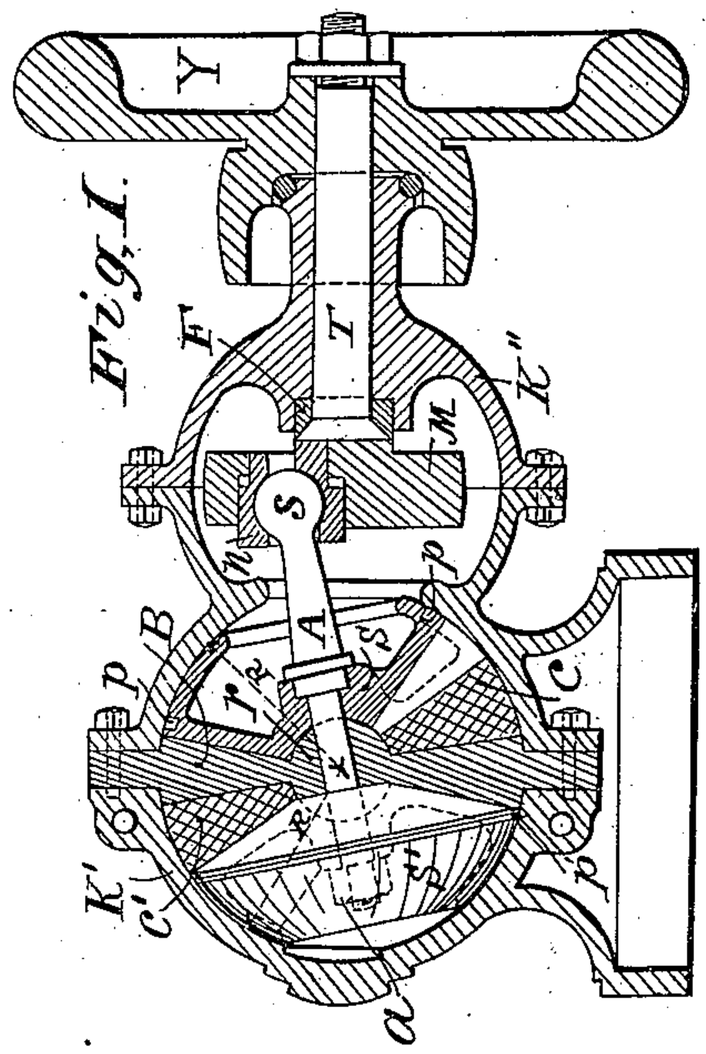


Fig. 6.

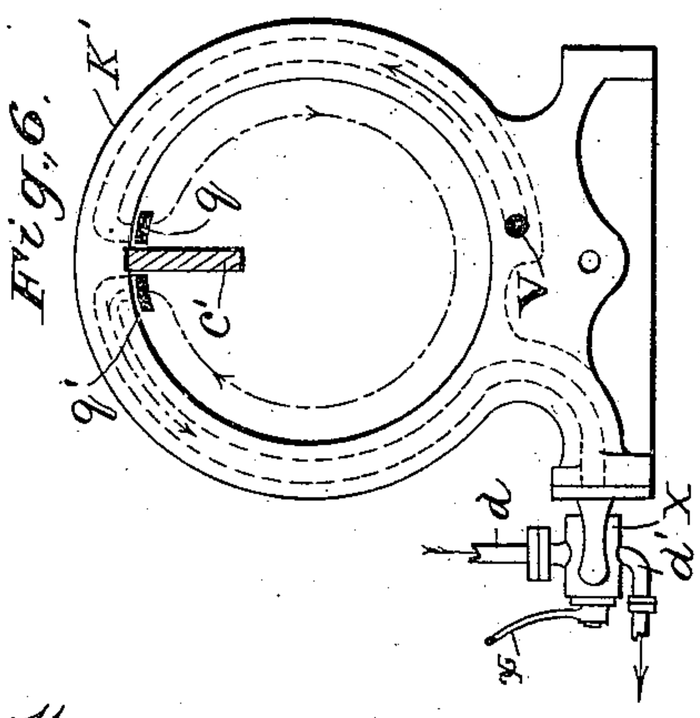
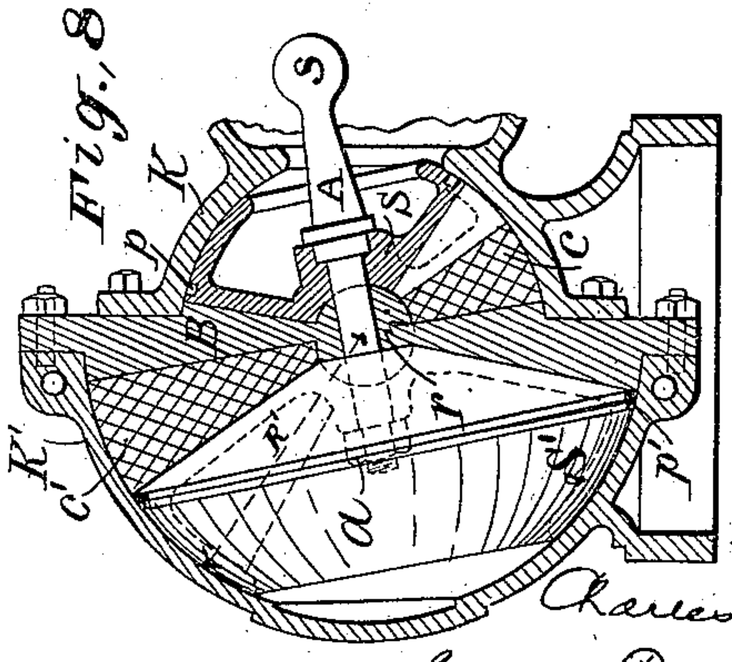


Fig. 8.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES ROUX, OF MONTBARD, FRANCE, ASSIGNOR OF ONE-HALF TO PHILIPPE BOUHEY, OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 607,085, dated July 12, 1898.

Application filed October 14, 1897. Serial No. 655,231. (No model.) Patented in France January 7, 1897, No. 262,871; in Switzerland May 4, 1897, No. 15,753; in Spain May 10, 1897, No. 20,832, and in Italy May 10, 1897, No. 44,666.

To all whom it may concern:

Be it known that I, CHARLES ROUX, of Montbard, Côte-d'Or, France, have invented new and useful Improvements in Rotary Engines, Motors, Pumps, or the Like, which are fully set forth in the following specification, and for which foreign patents have been obtained, as follows: In France, No. 262,871, dated January 7, 1897; in Switzerland, No. 15,753, dated May 4, 1897; in Spain, No. 20,832, dated May 10, 1897, and in Italy, No. 44,666, dated May 10, 1897.

This invention for improvements in motive-power apparatus, pumps, and the like relates to a motor of spheroidal form suitable for use with steam, air, or hydraulic power and for exhausting or forcing gas or water or other fluid. It is characterized by a mechanism effecting a continuous rotary motion without shocks at very high speed under the action of a gas or other fluid. The cylinder or casing of the mechanism comprises two separate parts or truncated spheres rigidly connected together with an intermediate separating circular disk, ball-shaped at its center. This plate divides the interior capacity of the spherical cylinder or casing into two parts surrounding the pistons. The interior conical faces or surfaces of this plate receive on opposite sides at the extremities of a diameter and situated in the same plane a fixed partition that penetrates with slight friction in a recess in the spheroidal piston oscillating about the partition and forms an abutment for the motive fluid.

Figure 1 shows in vertical section a spheroidal motor with its two chambers or distinct spheroidal capacities, in each of which works the spheroidal truncated piston. Fig. 2 shows in front view one of the two small fixed separating-partitions that bear against the circular plate extending from the interior periphery of each of the chambers to the ball. Figs. 3 and 4 show a variation of the arrangement shown in Fig. 2. Fig. 5 is an elevation of the motor, in the front of which is shown a double-valve cock. The steam enters by the upper orifice, and exhausts by the lower orifice, of this cock. Figs. 6 and 7 are two sections, one at the left (Fig. 6) of the left-hand-side casing and the other at the right (Fig. 7) of the right-hand-side casing. On each of these sections is shown in its place the projection of the small separating-partition. Fig. 8 is a view similar to Fig. 1, showing a form of my motor in which one of the pistons and its chamber is larger than the other.

The casings or semispherical coverings K K′ form a chamber that the circular fixed plate B, formed at its center as a ball *r*, Fig. 1, separates into two distinct parts, in which work the two spherical pistons S S′, provided with packing-rings *p p′*, bearing against the interior surface of the casing. The front of the piston is in the form of a cone that bears by successive generatrices as it oscillates on the surface of the partition B. These two pistons either have the same radius, or one, S′, has a radius R′ larger than that of the radius R, as shown in Fig. 8, so as to allow for any expansion desired of the motive fluid.

Contact between the truncated conical surfaces of the pistons S S′ and the dished faces of the partition B is insured by the rotary movement of the arm A, passing at one end through the centers of pistons S S′ (and the opening through the central ball *r* of partition B) and secured therein by a nut *a* and terminating at its other end in a ball *s*, turning freely in a bearing *n* of crank-disk M. On the shaft T, carrying the crank-plate M and passing through the bearing formed by the casing K″ with slight friction, is keyed the fly-wheel Y. A ring F of vulcanized fiber or other convenient matter forms a tight joint. Finally, at the outer extremity of the fixed support, serving as a bearing for the shaft T and the fly-wheel Y, is arranged a ball-bearing F′, that gives a very slight lateral resistance to rotation.

The central ball *r* of the plate B makes joint with the hollow central parts of the top of the pistons S S′. The rings *p p′* insure the tightness of the contact between the spherical parts of the pistons S S′ and the spherical surfaces of the casing.

The small projecting partitions *c c′* extend

from the casings K K′ to the central ball *r* and are fixed to the plate B, and each of these partitions enters a triangular recess *o o′*, Fig. 2, in the face of the pistons S S′, respectively.

As shown in Fig. 2, the shape of the openings *o o′*, in which project the partitions *c c′*, is such as to permit the oscillating undulatory motion of the pistons. To form a better joint and one of larger area between the partitions *c c′*, said partitions may be formed with a covering *g* of the shape shown in Figs. 3 and 4.

The two-way cock effecting the distribution of the motive fluid is indicated at the foot of Figs. 5, 6, and 7. The fluid enters by the pipe *d*, follows the course indicated by the arrows, and exhausts by the lower outlet *d′*. By turning handle *x* of valve X the steam or other fluid may be caused to pass through the motor in a reverse direction, causing a corresponding reversal in the direction of movement of shafts A and T.

The two casings K K′, between which is fixed the plate B and surrounding hermetically the pistons S S′, show on their respective sections, at the left, Fig. 6, and at the right, Fig. 7, the inlet-ports *l* and *q* and the exhaust-ports *l′* and *q′* of the motive fluid and the course followed, as follows: The admission of fluid entering by the pipe *d* is made at full pressure by the right-hand-side passage *l*, Fig. 7, and said fluid abutting on the right-hand face of the said partition *c* expands along the circular course indicated by the arrow. After a complete revolution of the ball *s*, to which, as well as to the crank M, the movement of the piston is transmitted by the arm A, the steam exhausts by the opening *l′* on the left of the partition *c* and passing by passage V from one casing K to the other K′ drawn at the left, Fig. 6, at the left of the vertical plane, passing through the center of the ball *r*. The motive fluid follows then the course of the arrows in the passage shown at the right in the casing K′ and enters by the port *q*, placed at the right of the partition *c′*, where it acts on the piston S′, following the circular course indicated by the arrows, and finally exhausts by the exhaust-outlet. The ports *l* and *q* serve, therefore, for the admission and the ports *l′* and *q′* serve for the exhaust.

The action of the expansion of the gaseous fluid on the piston S′ acts in the same manner as the introduction at full pressure of the said fluid on the piston S and the effect is the same, and the successive, and simultaneous action of the two pistons causes a rotation of the shaft T and of the driving-pulley and fly-wheel fixed on its outer end.

It can be seen that the mechanical work produced on the face or truncated surface of the piston S is added to that produced on the face, equally truncated, of the piston S′, and that the shaft T collects the sum and transmits it to the driving-pulley fixed on it and presses by a force when rotating against the ball-bearing.

The motor described can also work as a motor with a liquid under pressure. It can also work as suction-pump or forcing-pump, the special transmitting mechanism just described driving or being driven.

For a hydraulic motor it is sufficient to connect the liquid under pressure to the inlet-ports of the chambers formed by the casings or coverings K K′, while the exhaust takes place by the exhaust-ports of the said chambers. For the apparatus to work as pump it is sufficient to rotate the shaft by any suitable power or by means either of a dynamo or even of a motor "spheroidal" and to connect the suction-tube to the inlet-ports of the casing K and K′ and the delivering-pipe to the exhaust-ports of the casing.

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

1. In a motor, the combination with the casing formed in two semispherical parts, a partition interposed between said parts formed at its center as a ball with an opening therethrough, and having its opposite faces dished toward said central ball forming frusto-conical surfaces, and auxiliary partitions on each side of and projecting from the main partition along radii thereof, of two pistons having frusto-conical surfaces formed with bearing-recesses at their centers conforming to the contour of the bearing-ball of partition B, a piston-rod passing at one end through the pistons and through the opening in the center of the bearing-ball and tightly securing said piston in place, by means such as a nut screw-threaded onto the extremity of said piston-rod, and a shaft to which the outer end of said piston-rod communicates motion, substantially as described.

2. In a motor, the combination with the casing formed in two semispherical parts, a partition interposed between said parts and formed at its center as a ball with an opening therethrough, auxiliary partitions, one on each side of and projecting from the main partition along radii thereof extending in opposite directions, the inclosing casing having inlet and exhaust openings therethrough for the motive fluid on opposite sides respectively of said auxiliary partitions, one of the exhaust-openings communicating with the inlet-opening to the opposite side of the main partition, of two pistons, one on each side of the main partition, having truncated conical surfaces on one side operating against said partition, said surfaces being suitably recessed to receive the auxiliary partitions, a piston-rod connecting said pistons, passing through the opening in the ball of the main partition, and having a projecting end, and a shaft rotated by said projecting end of the piston-rod through suitable connections, substantially as described.

3. In a motor, the combination with the casing formed in two semispherical parts, a partition interposed between said parts and formed at its center as a ball with an opening therethrough, auxiliary partitions, one on each side of and projecting from the main partition along radii thereof extending in opposite directions, the inclosing casing having inlet and exhaust openings therethrough for the motive fluid on opposite sides respectively of said auxiliary partitions, one of the exhaust-openings communicating with the inlet-opening to the opposite side of the main partition, and a two-way valve controlling the passage for the motive fluid to, and the exhaust from, the motor, whereby the operation of the motor may be reversed, of two pistons, one on each side of the main partition, having truncated conical surfaces on one side operating against said partition, said surfaces being suitably recessed to receive the auxiliary partitions, a piston-rod rigidly connecting said pistons, passing through the opening in the ball of the main partition, and having a projecting end, and a shaft rotated by said projecting end of the piston-rod through suitable connections, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

C. ROUX.

Witnesses:
FRANÇOIS LESSESRR,
ELIE BILLEVY.