No. 779,900. PATENTED JAN. 10, 1905.

L. G. BARTLETT.

ROTARY ENGINE.

APPLICATION FILED AUG. 13, 1903.

2 SHEETS—SHEET 1.

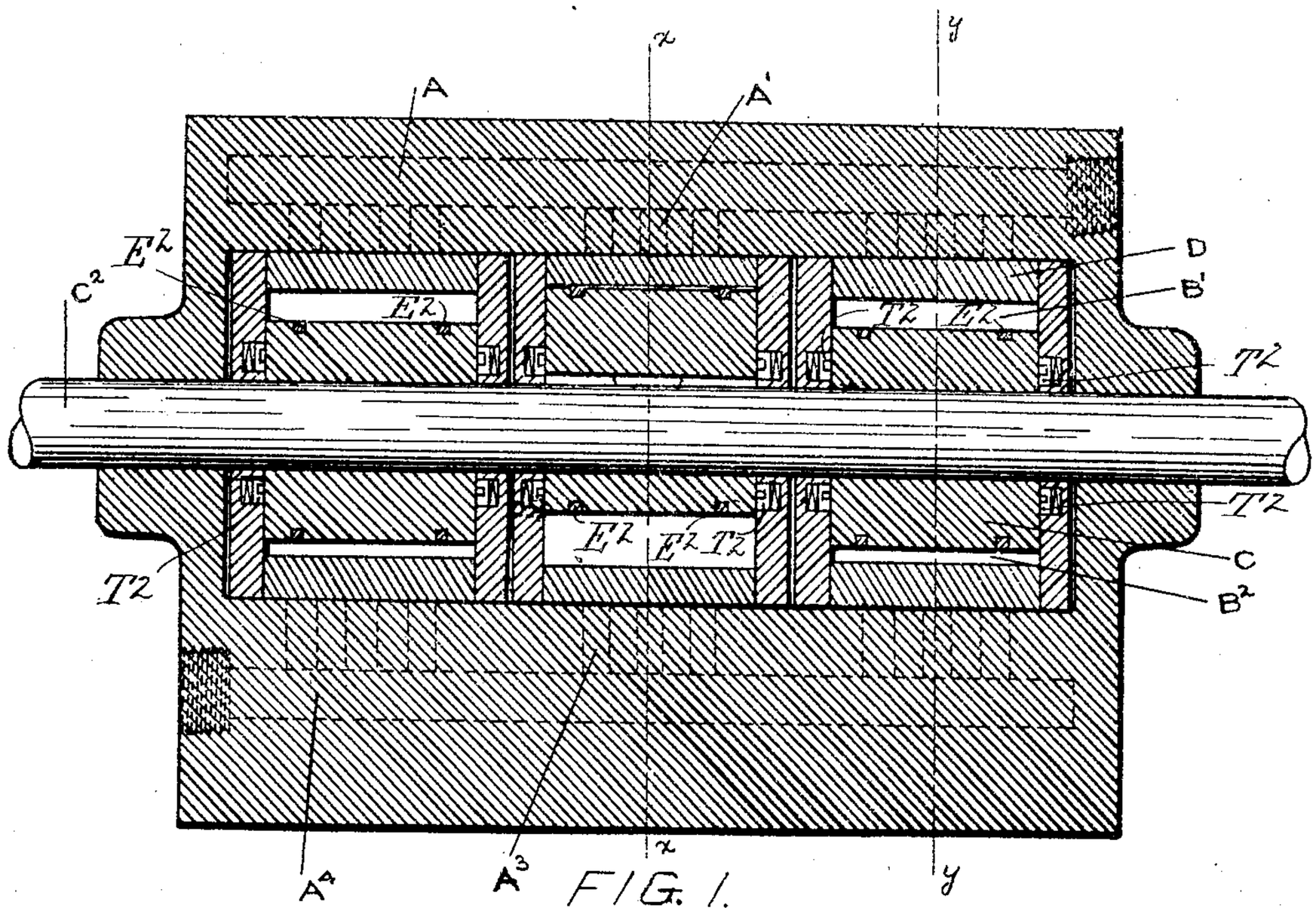

FIG. 1.

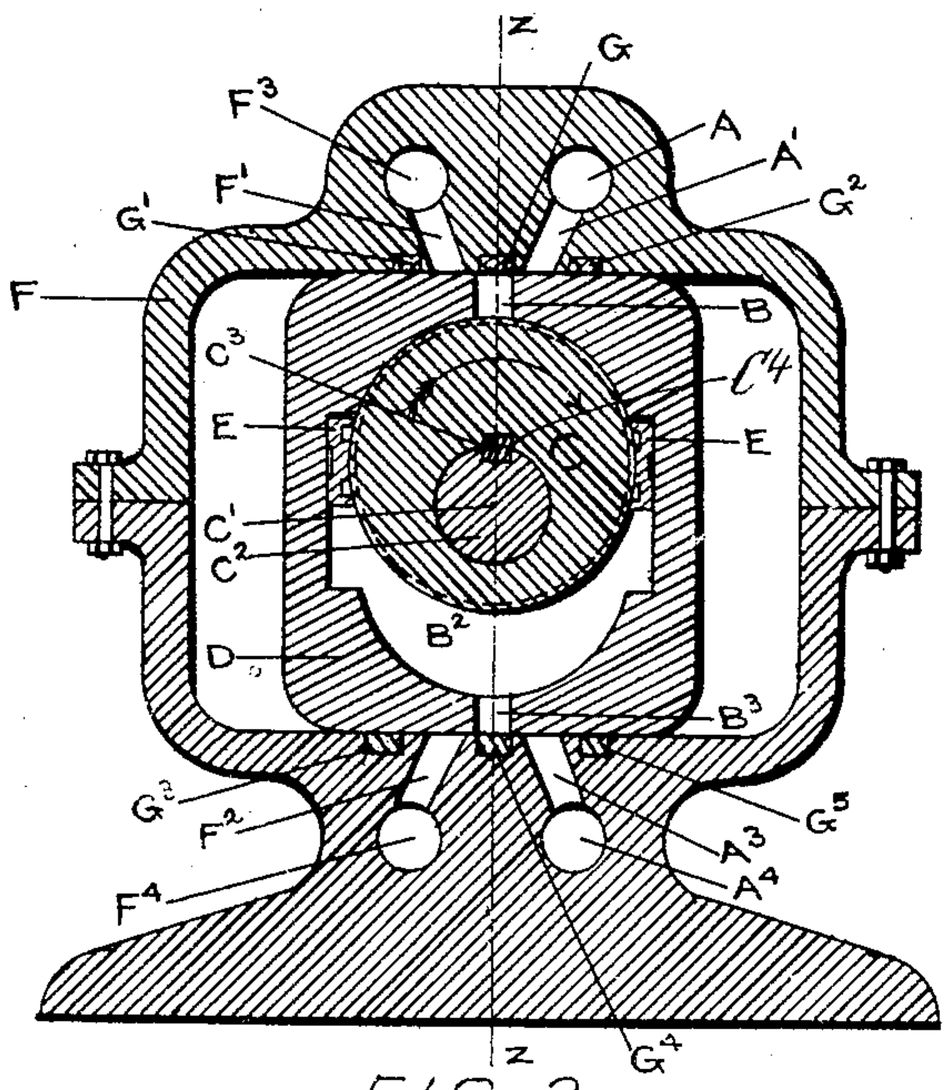

FIG. 2.

WITNESSES:

Ben Ekenp

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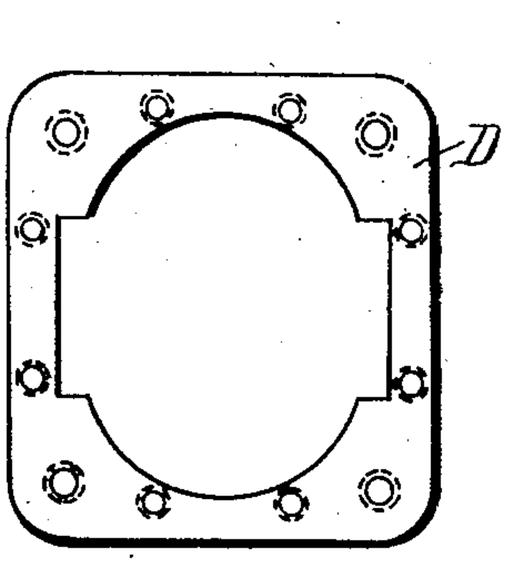

FIG. 4

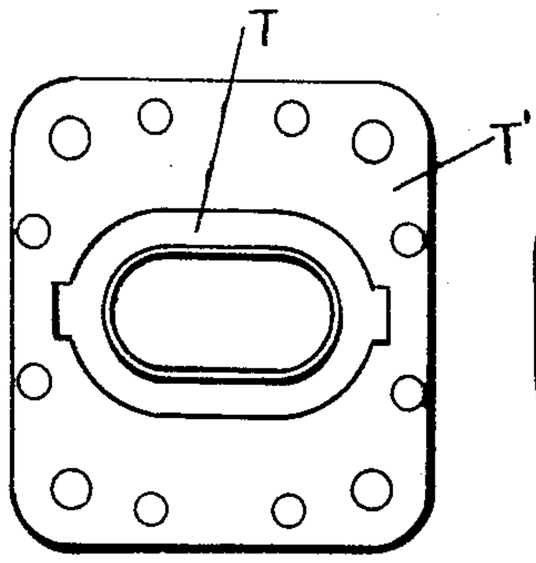

FIG. 5

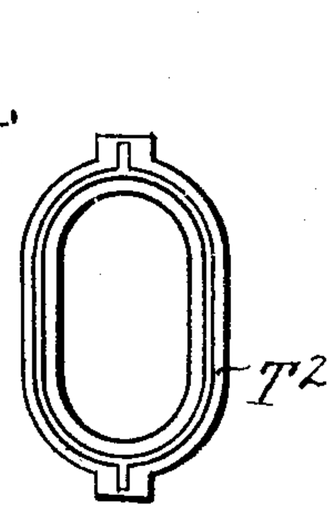

FIG 6

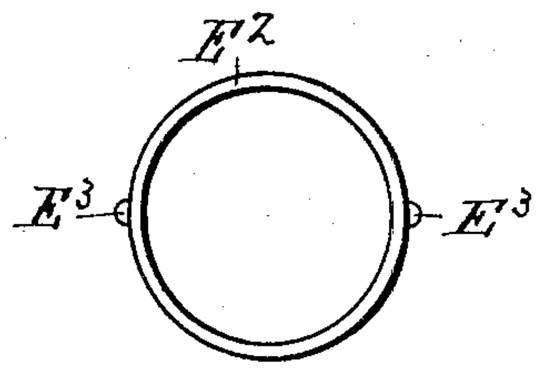

FIG. 7.

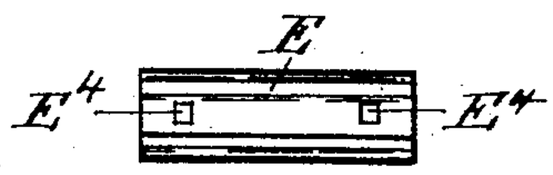

FIG. 8.

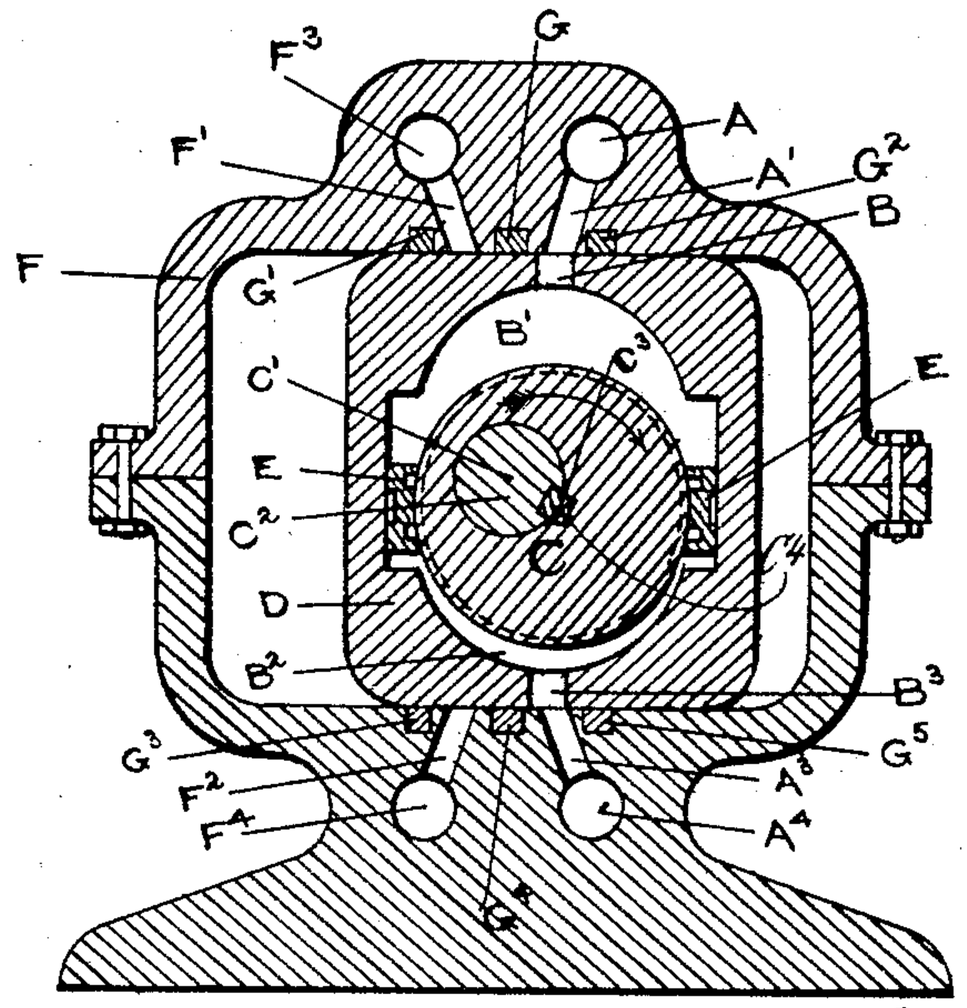

FIG. 3

WITNESSES:

Bert Ellenyo

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By J. H. Rucker

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No. 779,900. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

LOUIS GARDINER BARTLETT, OF EAST SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO SIMPLEX ENGINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 779,900, dated January 10, 1905.

Application filed August 13, 1903. Serial No. 169,412.

To all whom it may concern:

Be it known that I, LOUIS GARDINER BARTLETT, of East Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Rotary Fluid-Engines, of which the following is a specification.

My invention relates to the combined construction and functions of rotary fluid-engines which may be operated either as a motor to impart motion to external devices in consequence of pressure in a fluid medium or as a pump to actuate and produce motion or compression in fluids.

The present invention has for its object simplification of construction and increase in durability of rotary fluid-engines and the reduction of the leakage of the fluid medium therein to a minimum, securing thereby greater efficiency of said device.

The main features of my invention are one or more eccentric pistons mounted upon a shaft preferably at different angles and designed to rotate each within a reciprocating fluid-pressure chest or valve-spacer provided with an oblong bore, said bore consisting, preferably, of two diametrically opposite semicircular recesses or chambers of different centers and of substantially the same radius as the piston. Each piston upon rotation cooperates alternately with each recess or chamber in its respective fluid-pressure chest or valve-spacer, imparting a reciprocating motion thereto. Oblong openings are provided in the heads of said fluid-pressure chests or valve-spacers inclosing the shaft and of sufficient length to allow the said reciprocating motion. Each recess or fluid-pressure chamber is provided with ports or openings which are effective upon reciprocation of said fluid-pressure chest within a stationary casing to communicate alternately with a fluid entrance and exit situated in said casing. Extensions of the heads of said casing form bearings for the shaft. The recesses or fluid-chambers in each pressure-chest or valve-spacer are separated and made fluid-tight by means of partitions consisting, preferably, of sliding shoes in continuous contact with the curved peripheral surface of the piston and the internal sides of the fluid-pressure chest and maintaining diametrically opposite positions thereon. The position of the sliding shoes is maintained by means of rings which fit in annular grooves around said piston. Small semicircular projections on said rings at diametrically opposite positions fit in similarly-formed recesses in said sliding shoes, and as the piston rotates the said sliding shoes are carried thereby. In order to prevent leakage of the steam or other fluid past the end of the piston or pistons, I utilize a packing at each end consisting of grooved rings of oblong shape with extensions on each end, which rings fit in similarly-formed recesses in the inner surface of the heads of said fluid-pressure chests and surround the shaft. The ends of the piston slide on the said grooved packing-rings, which rings are pressed toward the piston by means of springs inserted behind said rings.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a vertical longitudinal sectional view of the rotary fluid-engine on line Z Z, Fig. 2. Fig. 2 is a cross-sectional view of the engine on line X X, Fig. 1. Fig. 3 is a cross-sectional view of the engine on line Y Y, Fig. 1. Fig. 4 is an end view of one of the fluid-pressure chests or valve-spacers. Fig. 5 is a view of one of the heads of said fluid-pressure chest. Fig. 6 is a detail view of one of the grooved packing-rings fitting in similarly-formed recesses in said heads. Fig. 7 is a detail view of one of the annular rings fitted in grooves around the piston, which rings carry the sliding shoes. Fig. 8 is a detail view of one of the sliding shoes, showing method of attaching to the annular rings.

Like letters of reference refer to like parts throughout the several views.

When the engine is operated as a motor, the

pressure fluid enters the channel A (see Fig. 3) through the port A′, thence through the port B into the space or chamber B′ between the piston C and the fluid-pressure chest or valve-spacer D. As the preponderance of the piston C lies between the center of rotation C′ and the sliding shoe E the piston is caused to rotate in the direction indicated by the arrow. In the meantime any fluid in the space or chamber B^2 will exhaust through the port B^3, (as the piston C coöperates with the space or chamber B^2,) thence through the port A^3, and finally through the channel A^4. As the piston C rotates in the direction indicated it acts as a cam and causes the fluid-pressure chest D to slide in the casing F, causing the port B to pass into communication with the port F′ and the port B^3 with the port F^2. The pressure fluid then enters through the channel F^4, the port F^2, and the port B^3 into the space or chamber B^2. In this position of the parts the preponderance of the piston C lies between the center of rotation C′ and the sliding shoe E′, causing the piston to continue to rotate in the same direction. In the meantime the fluid in the space or chamber B′ exhausts through the port B, thence through the port F′, and finally through the channel F^3. As the ports B and B^3 alternately communicate, respectively, with the ports A′ and F′ and A^3 and F^2 the operation is repeated, as hereinbefore described. The channels F^3 and A^4 are fluid-exits, and the channels A and F^4 are fluid-entrances. The sliding shoes E and E′ are fastened upon rings E^2, fitted in annular grooves around the face of the piston C, and as the said piston C rotates the said sliding shoes E and E′ slide back and forth, maintaining diametrically opposite positions thereon and preventing the leakage of fluid from the chamber B′ into the chamber B^2. The piston C is fastened to the shaft C^2 by means of the key C^4 and having its center of rotation at C^3. The packing-strips G, G′, G^2, G^3, G^4, and G^5 are fitted in the casing F and prevent leakage of the fluid between said casing F and the fluid-pressure chest or valve-spacer D. The grooved packing-ring T^2, Fig. 6, fits in the groove T in the head T′ of the fluid-pressure chests, Fig. 5. As shown in the drawings, on each of said pistons there are two rings E^2, provided with diametrically-located projections E^3, which fit into recesses E^4 in the shoes E.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a rotary piston eccentrically mounted upon said shaft, an inclosed reciprocating fluid-pressure chest or valve-spacer having an internal oblong bore, said spacer mounted in moving fit within said casing and inclosing said rotary piston, sliding partition-walls in said spacer in continuous contact with the curved peripheral surface of said rotary piston at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chest or valve-spacer, and means for entrance and exit of fluids.

2. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a plurality of rotary pistons eccentrically mounted upon said shaft, a plurality of inclosed reciprocating fluid-pressure chests or valve-spacers having internal oblong bores, said spacers mounted in moving fit within said casing and inclosing said rotary pistons, sliding partition-walls in said spacer in continuous contact with the curved peripheral surfaces of said rotary pistons at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chests or valve-spacers, and means for entrance and exit of fluid.

3. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a rotary piston eccentrically mounted upon said shaft, a reciprocating fluid-pressure chest or valve-spacer having an internal oblong bore, heads fitted upon said spacer inclosing said bore, said spacer mounted in moving fit within said casing and inclosing said rotary piston, sliding partition-walls in said spacer in continuous contact with the curved peripheral surface of said rotary piston at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chest or valve-spacer, and means for entrance and exit of fluid.

4. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a plurality of rotary pistons eccentrically mounted upon said shaft, a plurality of reciprocating fluid-pressure chests or valve-spacers having internal oblong bores, heads fitted upon said spacers inclosing said bores, said spacers mounted in moving fit within said casing and inclosing said rotary pistons, sliding partition-walls in said spacer in continuous contact with the curved peripheral surfaces of said rotary pistons at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chests or valve-spacers, and means for entrance and exit of fluid.

5. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a rotary piston eccentrically mounted upon said shaft, a reciprocating fluid-pressure chest or valve-spacer having an internal oblong bore, heads fitted upon said spacer inclosing said bore, means in said heads inclosing said shaft allowing a lateral motion thereon, said spacer mounted in moving fit within said casing and inclosing

said rotary piston, sliding partition-walls in said spacer in continuous contact with the curved peripheral surface of said rotary piston at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chest or valve-spacer, and means for entrance and exit of fluid.

6. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a plurality of rotary pistons eccentrically mounted upon said shaft, a plurality of reciprocating fluid-pressure chests or valve-spacers having internal oblong bores, heads fitted upon said spacers inclosing said bores, means in said heads inclosing said shaft for allowing a lateral motion thereon, said spacers mounted in moving fit within said casing and inclosing said rotary pistons, sliding partition-walls in said spacer in continuous contact with the curved peripheral surfaces of said rotary pistons at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chests or valve-spacers, and means for entrance and exit of fluid.

7. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a rotary piston eccentrically mounted upon said shaft, a reciprocating fluid-pressure chest or valve-spacer having an internal oblong bore, heads fitted upon said spacer inclosing said bore, means in said heads inclosing said shaft allowing a lateral motion thereon, said spacer mounted in moving fit within said casing and inclosing said rotary piston, sliding partition-walls in said spacer in continuous contact with the curved peripheral surface of said rotary piston at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chest or valve-spacer, means for entrance and exit of fluid, ports in said spacer, said ports effective upon reciprocation of said spacer to communicate alternately with the fluid-entrance and fluid-exit.

8. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a plurality of rotary pistons eccentrically mounted upon said shaft, a plurality of reciprocating fluid-pressure chests or valve-spacers having internal oblong bores, heads fitted upon said spacers inclosing said bores, means in said heads inclosing said shaft allowing a lateral motion thereon, said spacers mounted in moving fit within said casing and inclosing said rotary pistons, sliding partition-walls in said spacer in continuous contact with the curved peripheral surfaces of said rotary pistons at diametrically opposite points thereon, means for imparting a reciprocating motion to said fluid-pressure chests or valve-spacers, means for entrance and exit of fluid-ports in said spacers, said ports effective upon reciprocation of said spacers to communicate alternately with the fluid-entrance and fluid-exit.

9. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a rotary piston eccentrically mounted upon said shaft, a reciprocating pressure-chest or valve-spacer having an internal oblong bore, longitudinal grooves in the internal sides of said spacer, sliding shoes mounted in said grooves, said grooves of greater width than said shoes, said shoes in constant sliding contact with the curved peripheral surface of said rotary piston and the bottom of said longitudinal grooves, means for maintaining diametrically opposite positions of said shoes, heads fitted upon said spacer inclosing said oblong bore, means in said heads inclosing said shaft allowing a lateral motion thereon, said spacer mounted in moving fit within said casing and inclosing said rotary piston, means for imparting a reciprocating motion to said spacer, means for entrance and exit of fluid, ports in said spacer, said ports effective upon reciprocation of said spacer to communicate alternately with the fluid-entrance and fluid-exit.

10. In a rotary fluid-engine, a casing, a shaft centrally mounted therein, a plurality of reciprocating fluid-pressure chests or valve-spacers having internal oblong bores, longitudinal grooves in the internal sides of said spacers, sliding shoes mounted in said grooves, said grooves of greater width than said shoes, said shoes in constant sliding contact with the curved peripheral surfaces of said rotary pistons and the bottoms of said longitudinal grooves, a plurality of means for maintaining diametrically opposite positions of said shoes, heads fitted upon said spacers inclosing said oblong bores, means in said heads inclosing said shaft allowing a lateral motion thereon, said spacers mounted in moving fit within said casing and inclosing said rotary pistons, means for imparting a reciprocating motion to said spacers, means for entrance and exit of fluid, ports in said spacers, said ports effective upon reciprocation of said spacers to communicate alternately with the fluid-entrance and fluid-exit.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of July, A. D. 1903.

LOUIS GARDINER BARTLETT.

Witnesses:
E. L. HARLOW,
A. L. MESSER.