(No Model.) 2 Sheets—Sheet 1.

E. D. BANGS.

ROTARY ENGINE.

No. 457,980. Patented Aug. 18, 1891.

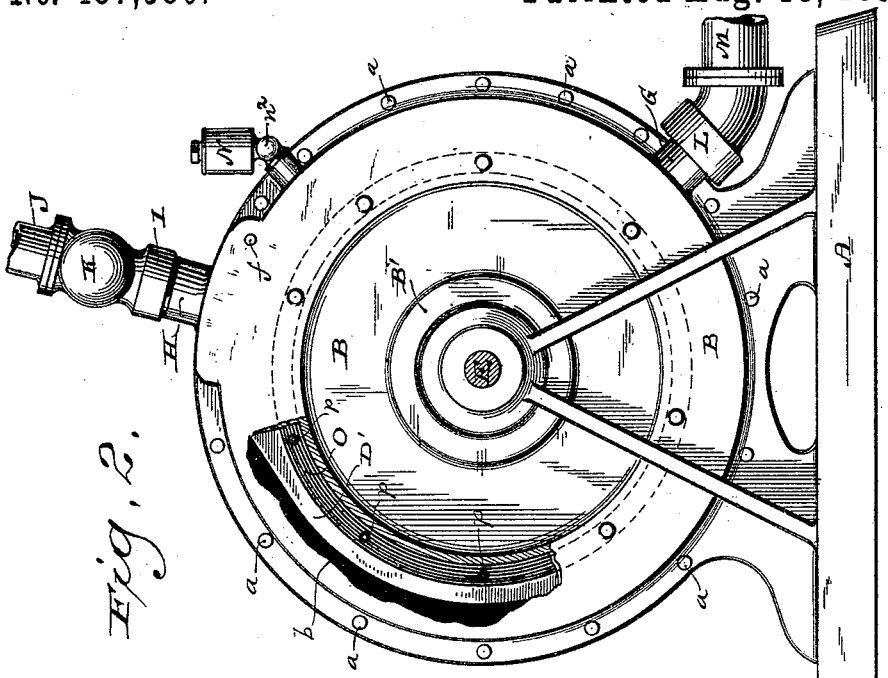

Fig. 2.

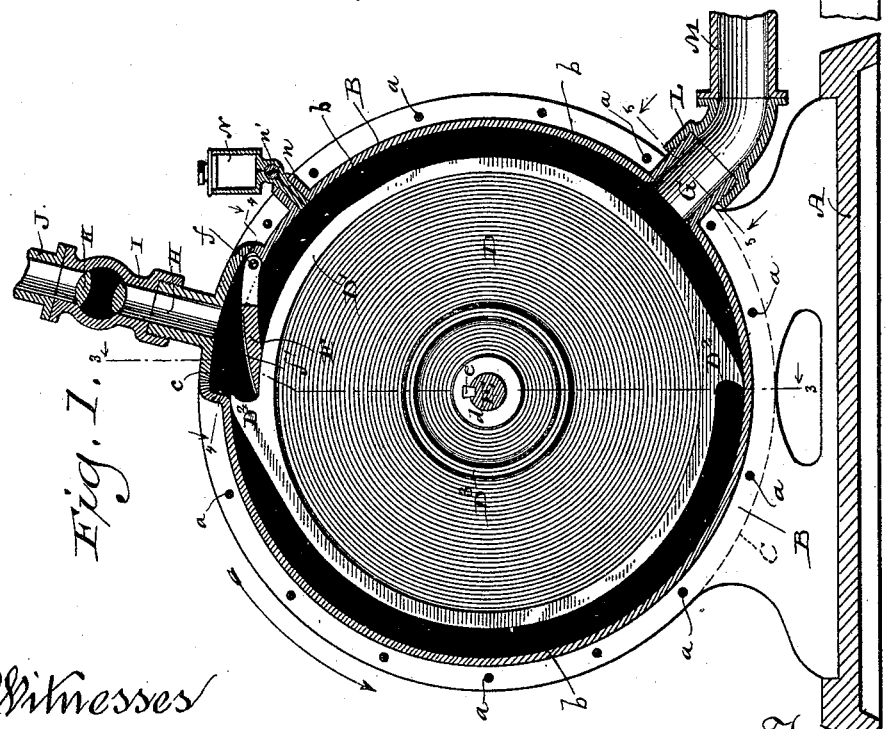

Fig. 1.

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Fig. 5.

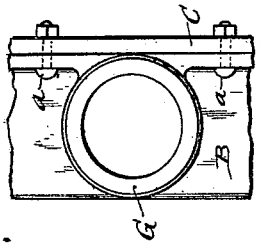


Fig. 3.

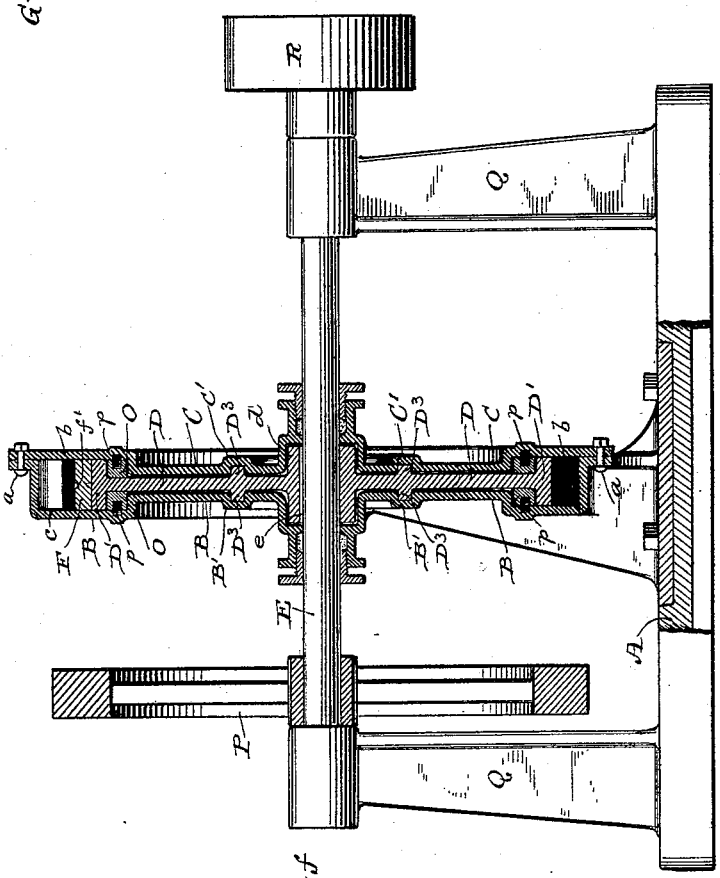
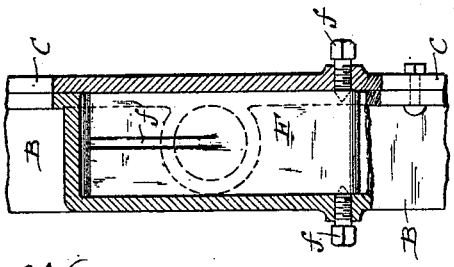


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN D. BANGS, OF MILWAUKEE, WISCONSIN.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 457,980, dated August 18, 1891.

Application filed September 15, 1890. Serial No. 365,004. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. BANGS, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to rotary engines; and it consists in certain peculiarities of construction, as fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a vertical central longitudinal sectional view through my said device. Fig. 2 is a side elevation of the same, partially broken away. Fig. 3 is a transverse vertical section of the same on the line 3 3 of Fig. 1. Figs. 4 and 5 are detail sectional views on the lines 4 4 and 5 5, respectively, of Fig. 1.

A represents the base of my engine, and within said base is set the lower end of the shell B and its cap-piece C. Both these parts B and C have their greatest lateral extension at the periphery and center, and when put together and secured by the bolts or screws *a a* form an annular peripheral steam-chamber *b c*. (Shown in black in Fig. 1.)

D represents a wheel or rotary piston having an enlarged hub *d*, perforated for the passage of the shaft E therethrough, said shaft and hub being suitably secured together, as by a key *e*. The periphery D′ of this wheel-piston D is much wider than the body thereof, extending the full width of the described steam-chamber *b c*, and at two or more points the said periphery D′ is provided with outward extensions or projections D^2, which extend the full height or depth of the main chamber *b*, but are of less projection than the height of the portion *c* of said chamber *b*. This portion *c* is provided with a hinged gate or valve F, preferably secured by pivot-bolts *f f*, and this gate is adapted to be received up at the proper time within the extension *c* of the steam-chamber *b*, leaving the entire chamber of the same depth or height throughout, and at other times to drop down upon the periphery D′ of the wheel-piston D, as shown in Fig. 1, and said gate or valve F is further provided with a groove or channel *f′* upon its upper side from about the center to one end thereof, as best shown in Fig. 4.

The shell B is provided with one or more exhausts G and steam-inlets H, only one exhaust and inlet being shown in the drawings, every inlet H opening into an extended portion *c* of the steam-chamber *b* described.

I represents a suitable coupling connected to the inlet H, and J a steam-pipe leading thereto, and K a throttle in said coupling, while L is a coupling on the exhaust, and M a pipe leading therefrom.

N is a lubricator of any approved construction, having a passage *n* leading to the dead-air portion of the chamber *b*, said lubricator having a valve *n′* and a suitable hand-wheel knob or crank n^2 to regulate the flow of oil therefrom into said dead-air portion.

The wheel-piston D is provided with annular projections D^3 D^3 on each side intermediate between its hub *d* and periphery D′, moving in corresponding annular grooves B′ C′ in the shell B and cap-piece C to steady said wheel-piston in its revolution; and, further, there are suitable packing-rings O O on each side of the said wheel-piston D, preferably against the inner sides of the periphery D′ thereof, having springs *p p* to keep said rings tightly against the said wheel-piston.

P is a fly-wheel on the shaft E, (which shaft is supported in suitable bearings in standards Q Q, rising from the base A of the device,) and R is a pulley for the transmission of power from the shaft E.

The operation of my device will be readily understood from the foregoing description of its construction, an engine with a single steam inlet and exhaust being illustrated, and hence described, but it being understood that these parts may be duplicated or repeated, according to the power required. Steam is admitted through the inlet H into the portion *c* of the chamber *b*, and this forces the gate or valve F firmly down, as shown in Fig. 1, so that no steam can pass beyond it, and the expansion of the steam pressing against the adjacent projection D^2 of the periphery D′ of the wheel-piston D forces the latter around in the direction of the arrow in Fig. 1 until the next projection D^2 is beyond the exhaust G, and as the wheel-piston D continues its revolution this other projection D^2 comes against

the under side of the gate or valve F and raises it, so that the said second projection passes to the position formerly occupied by the first projection D^2, and so on continuously, the wheel-piston always revolving in one direction and steam being always prevented from going back of the gate or valve F.

The contiguous parts of my device may have any additional packing necessary to insure tight joints, and oil will drop into the described dead-air portion of the chamber *b* whenever the lubricator is opened, thereby insuring perfect lubrication.

Should it happen that one of the described projections D^2 should chance to be beneath the gate or valve F, and the latter be consequently raised up into the described portion *c* of the chamber *b* when it is desired to start the engine, the steam from the inlet H will pass through the groove or channel *f'* in the upper side of the gate or valve F into the steam-chamber *b* beyond, the gate F being, as best shown in Fig. 1, of slightly less length than the length of the chamber-extension *c*, thus affording at the end of said gate the necessary lead from the groove *f'* to the said chamber *b*, and hence there will be no stoppage or "dead-center" to the device.

One great advantage of my device is that it exhausts of its own volition without requiring any of the expansive power of steam to accomplish this result, and therefore practically all of the steam is utilized for the creation of power.

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

1. In a rotary engine, the combination, with a shell and its cap, having lateral peripheral extensions forming an annular chamber, with an extension thereof at a given point, of a wheel-piston located within said shell and provided with a periphery extending the width of the said annular chamber, and projections on said periphery at intervals, extending the full height or depth of the chamber, a steam-inlet leading directly into said extension of the annular chamber, a gate or valve pivoted within said chamber-extension directly under said steam-inlet and of less length than the length of said chamber-extension and provided with a groove or channel in its upper or outer side in communication with said annular chamber, and an exhaust leading from said annular chamber.

2. In a rotary engine, the combination, with a shell and its cap, having lateral peripheral extensions forming an annular chamber, with an extension thereof in line with the steam-inlet, of a wheel-piston located within said shell and provided with a periphery extending the width of the said annular chamber, and projections on said periphery at intervals, extending the full height or depth of said annular chamber, spring-controlled packing-rings on each side of said wheel-piston adjacent to the inner sides of the periphery thereof, a steam-inlet leading to said extension of the annular chamber, a gate or valve pivoted within said chamber-extension, an exhaust leading from said annular chamber, and a lubricator communicating with the dead-air portion of the said annular chamber between the exhaust and steam-inlet, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EDWIN D. BANGS.

Witnesses:
H. G. UNDERWOOD,
WM. KLUG.