L. S. FLATAU.

ROTARY ENGINE.

APPLICATION FILED MAR. 27, 1912.

1,110,302.

Patented Sept. 8, 1914.

2 SHEETS—SHEET 1.

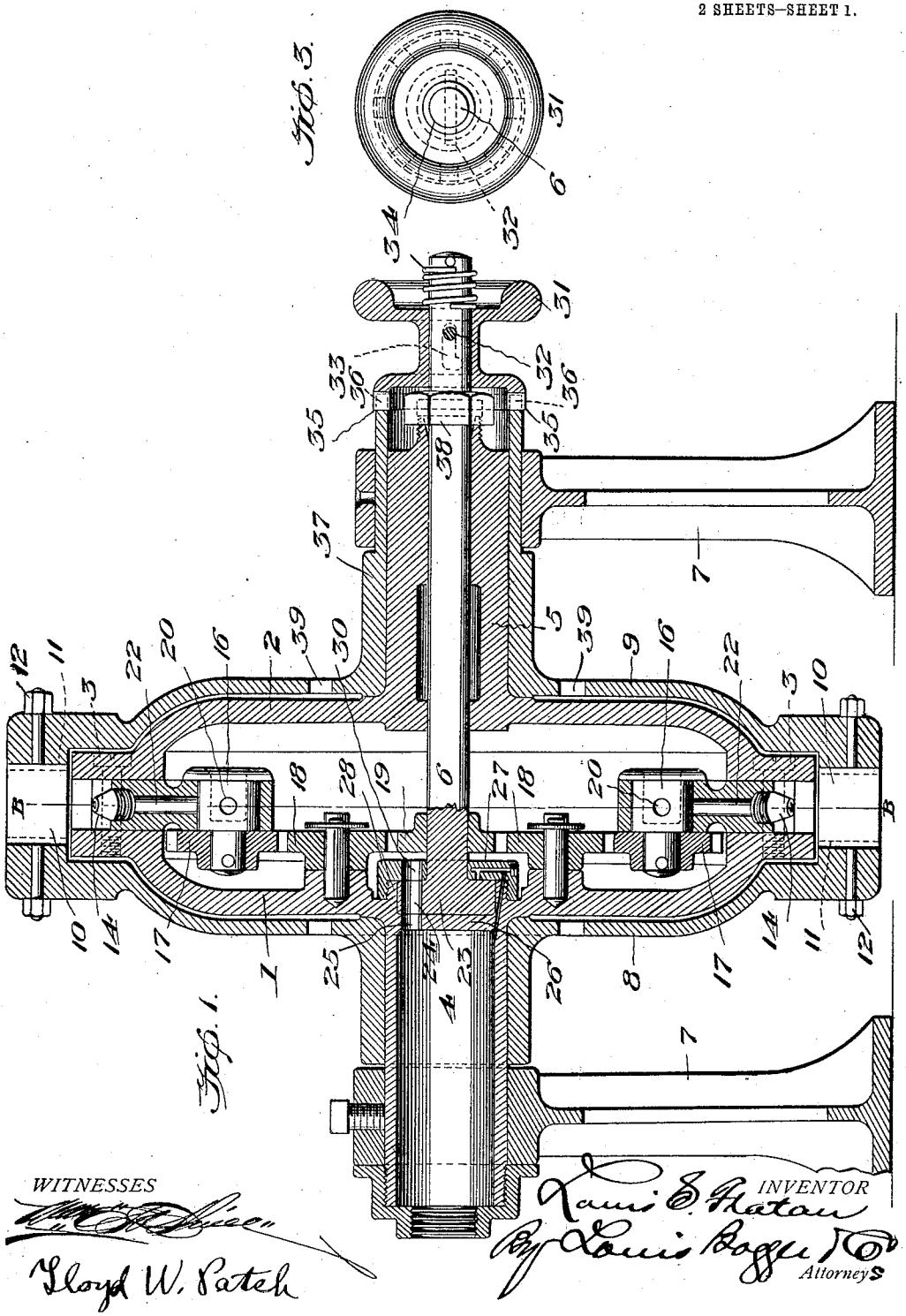


Fig. 3.

Fig. 1.

WITNESSES

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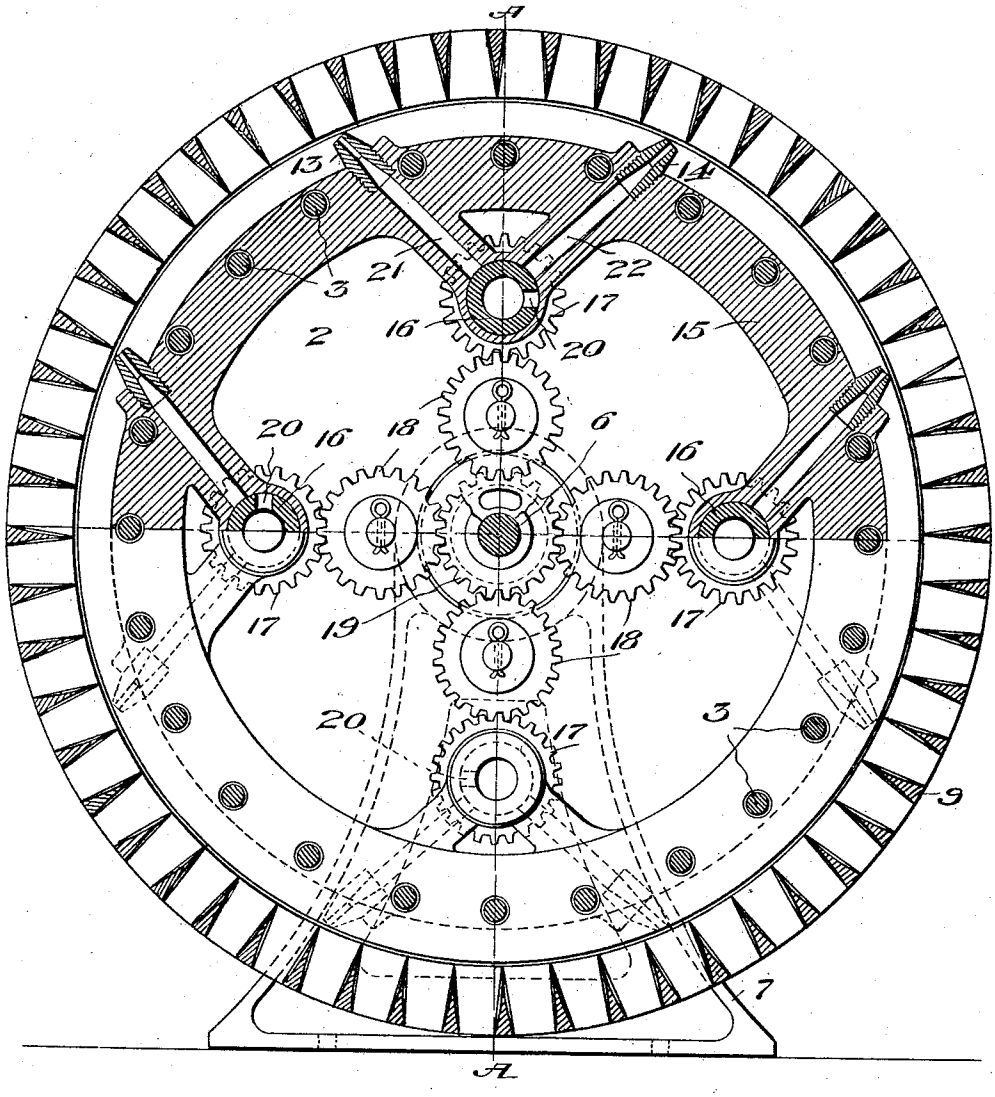
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS S. FLATAU, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO DUDLEY C. WRAY, OF ST. LOUIS, MISSOURI.

ROTARY ENGINE.

1,110,302. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed March 27, 1912. Serial No. 686,512.

To all whom it may concern:

Be it known that I, LOUIS S. FLATAU, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to an improvement in rotary engines of the turbine type, the object being to provide an engine in which various media may be employed to effect the propulsion of the engine, as for instance gas, steam, water, or the like.

This engine comprises few parts, assembled in compact form, and by actual test has developed a very high speed and satisfactory horse-power.

With the several objects mentioned in view, my invention comprises a stationary expansion chamber mounted on suitable standards, and inclosing therewithin suitable mechanism for discharging the propelling medium from various points simultaneously to drive a wheel which surrounds this chamber and is provided peripherally with radially-disposed vanes in position to be impinged by the propelling medium as it issues in jets from the expansion chamber, together with valves and means for simultaneously controlling said valves to regulate and control the discharge from the jets upon the wheel.

My invention further consists in certain novel features of construction and combinations of parts which will be hereinafter fully described and pointed out in the claims.

In the accompanying drawings: Figure 1 is a longitudinal section on the line A—A of Fig. 2, and Fig. 2 is a section at right angles to Fig. 1 on the line B—B of Fig. 1, and Fig. 3 is a detail.

The numerals 1 and 2 represent the two shells which, when together, constitute a stationary expansion chamber which receives and discharges the impelling medium, whether it be an explosive mixture, steam, or water, these shells being secured together by screws or bolts 3, 3, of which any number may be employed. The shells 1 and 2 have hubs 4, and 5, respectively, the former being hollow and serving as an inlet for the propelling medium, and the hub 5 is counterbored axially to receive the valve-stem 6. These hubs are supported and secured in the standards 7, 7. A rotary vane wheel is also made in two sections 8 and 9, the hollow hubs of which are counterbored and mounted to turn on the hubs 4 and 5 of the shells 1 and 2, and these shells 8 and 9 encompass the stationary expansion chamber, they being spaced apart and held together by the tapering radially-disposed vanes 10, 10, which latter are seated at their edges in grooves 11, 11, in the casings 8 and 9, and have nuts 12, 12, screwed on their outer ends to perform the duplex function of holding the vanes rigidly in place and the outer shells 8 and 9 together around the expansion chamber.

Within the expansion chamber, the various valves are provided for controlling the discharge of propelling medium through the nozzles. These nozzles are arranged in pairs radiating from a center common to each pair, one only of which nozzles of each pair is used at a time, either to drive the wheel forward or to reverse it, these nozzles 13 and 14 being removably screwed into the valve-ring 15, which latter is a spacer between the outer edges of the shells 1 and 2. At the point of intersection of each pair of nozzles, a valve 16 is rotatably mounted. Each of said valves has a gear-wheel 17 thereon, and intermediate gears 18, 18, meshing therewith also intermesh with a center gear-wheel 19 keyed on the valve-stem 6, so that when the latter is turned, the several valves 16, 16, are simultaneously rotated to bring the outlets 20 thereof into registry with either the tube 21 leading to nozzle 13 or tube 22 leading to nozzle 14 accordingly as the engine is to be driven forward or reversed. Also integral with the inner end of the valve-stem, or rigidly secured thereto is the inlet-valve 23, which has an opening 24, in position to register with an opening 25 in the head 26 formed across the inner end of the hub 4 through which the propelling medium, such as explosive gas, steam, or water is supplied, a cap 27 surrounding the valve-stem at this point and being screwed to a threaded nipple 28 on the inner wall or shell 1 to retain the valve 23 in place, this cap also having a hole 30 through which the propelling medium issues into the expansion chamber on its way to

the several valves 16, 16, which open into said chamber, whence it passes through the tubes 21 or 22 and the nozzles 13 or 14.

A throttle or hand wheel 31 is slidably attached to the outer end of the valve stem by means of a pin 32 operating in the L-shaped slot 33, and a spring 34 normally holds this throttle inward on the shaft. When the pin 32 is received in the L-shaped portion of the slot the stem can be turned for changing the position of the valves 16 for either shutting off the supply to the nozzles, or for bringing the valves in a position with respect to the nozzles for obtaining a reverse or positive drive.

A stuffing box 38 surrounds the valve-stem 6 and is screwed on to the outer end of the hub 5.

To keep the engine cool, the holes 39, 39, are provided in the shells 8 and 9. When it is desired to provide a constant drive, the throttle 31 is turned to a position so that the pin 32 is received in the L-shaped portion of the slot 33 which holds it in a position for rotating the stem 6. The inlet valve 23 is turned by the rotation of the stem 6 to such a position that its port 24 registers with the ports 25 and 30, and also through the gears 19, 18 and 17, causes the outlets 20 to register with either the tubes 21 or 22. The port 24 is in the form of an arced slot so that the stem 6 may be turned to bring the outlets 20 of the valves 16 into registry with either of the said tubes and yet preserve the passage through ports 24, 25 and 30. When steam is used as the propelling medium, this expansion chamber becomes an auxiliary boiler as it were, which keeps the nozzles well-supplied at all times.

The various valves might be manipulated by levers attached to the central stem in lieu of the gear-wheel, and in fact other slight changes might be resorted to without departure from the spirit and scope of my invention.

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

1. A rotary engine comprising an inner expansion chamber having nozzles which discharge radially therefrom, of a wheel mounted to turn on the hubs of said chamber and having vanes in position to receive the impact from the nozzles, and means for controlling the discharge from said nozzles.

2. A rotary engine comprising an expansion chamber, a wheel mounted to rotate about said expansion chamber, a plurality of reverse and positive drive nozzles in said chamber adapted to discharge against said wheel, a plurality of valves and each valve controlling the discharge from a reverse and a positive nozzle, whereby either the positive or reverse nozzle will be discharged at a time, means for connecting the several valves together, and means for operating all of the valves simultaneously.

3. A rotary engine comprising an expansion chamber, and a wheel incasing said chamber and provided with radially-disposed vanes at the periphery thereof, said vanes tapering to a thin edge toward the center and having concave surfaces.

4. A rotary engine comprising an expansion chamber, a wheel mounted to rotate about said expansion chamber, a plurality of reverse and positive drive nozzles in said chamber adapted to discharge against said wheel, a plurality of valves and each valve controlling the discharge from a reverse and a positive nozzle, whereby either the positive or reverse nozzle will be discharged at a time, and means for operating all of the valves simultaneously.

In testimony whereof I affix my signature, in the presence of two witnesses.

LOUIS S. FLATAU.

Witnesses:
T. W. WRAY.
E. OBERLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."