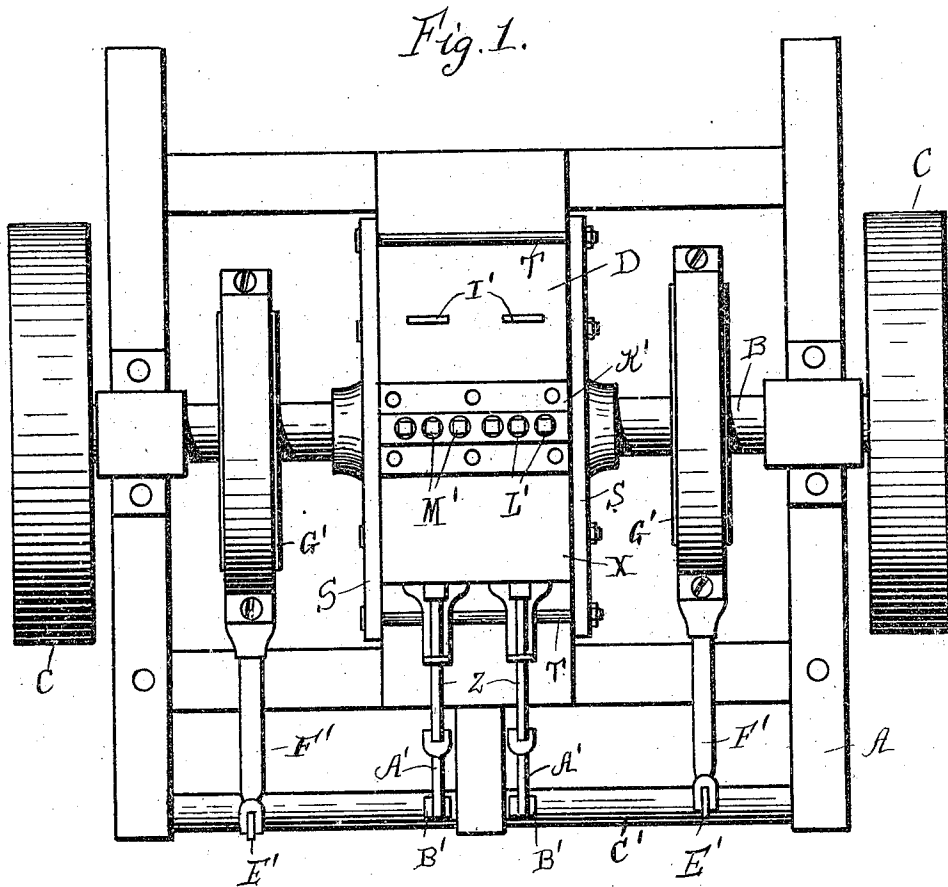


W. M. SPENCER.
 ROTARY ENGINE.
 APPLICATION FILED MAY 10, 1909.

950,249.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.



WITNESSES
R. H. Sears
A. C. Bunker

INVENTOR
William M. Spencer

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 ATTORNEY

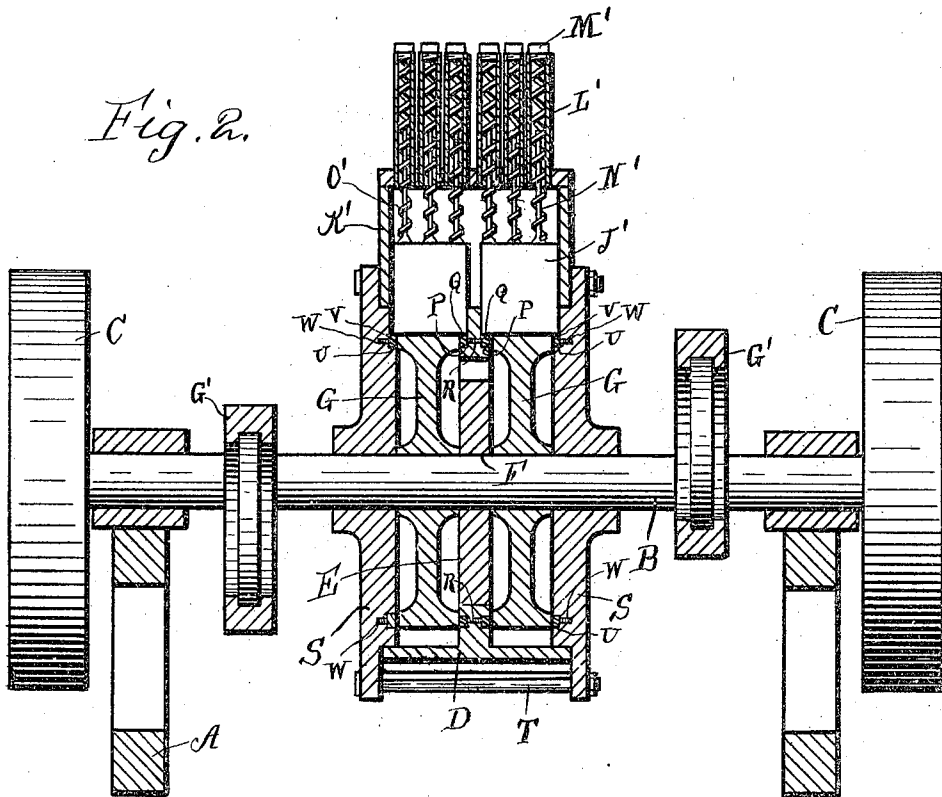
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3 SHEETS—SHEET 2.



WITNESSES

R. F. Leary
& C. Hutcherson

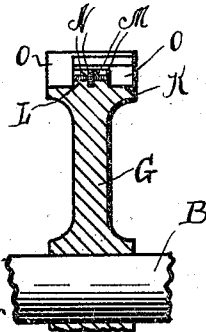
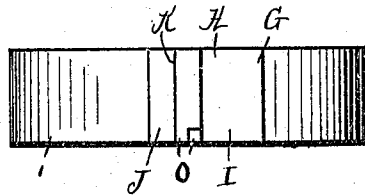
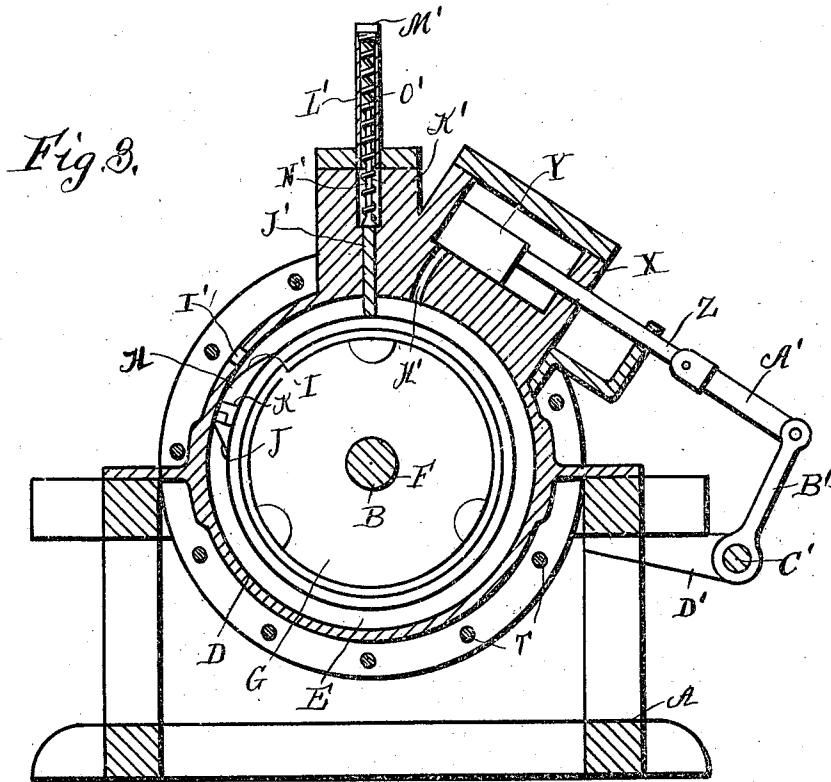
INVENTOR
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3 SHEETS—SHEET 3..



WITNESSES

Key Leap

As a Historian

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM M. SPENCER, OF BURNS, TENNESSEE.

ROTARY ENGINE.

950,249.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed May 10, 1909. Serial No. 495,176.

To all whom it may concern:

Be it known that I, WILLIAM M. SPENCER, a citizen of the United States, residing at Burns, in the county of Dickson and State of Tennessee, have invented a certain new and useful Improvement in Rotary Engines, of which the following is a specification.

My invention relates to a new and useful improvement in rotary engines, and has for its object to provide an exceedingly simple and effective device of this character whereby the lost motion or leverage on a machine may be overcome.

A further object of my invention is to so construct the wings so that they will smoothly run along the inside surface of the cylinder.

A still further object of my invention is to so form the buckets that the gate valves will gradually rise upward and then downward over the more abrupt incline or back of bucket to face of wheel.

Still further objects of my invention are to provide packing rings so situated that they will not weaken the parts of the engine and will form a better steam joint.

With these ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction in detail, referring by letter to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a plan view of my improved engine. Fig. 2, is a transverse sectional view of an engine made in accordance with my improvement. Fig. 3, a longitudinal sectional view thereof. Fig. 4, a view of one of the wheels. Fig. 5, a sectional view thereof.

In carrying out my invention as here embodied, A represents the frame, in which is mounted the shaft B and has journaled thereon at each end the fly wheels C. A casing D is supported on the frame and is preferably cylindrical in shape, and has a central web E therein, said web having an opening F thereby forming a bearing for the shaft B so as to support said shaft at approximately the central point thereof.

Received within the casing are the wheels G rigidly mounted on the shaft B. The rims of the wheels are provided with buckets H having the forward inclined surface I and rear inclined surface J for a purpose to be hereinafter described. In these buckets is formed an opening K having a rib L projecting therein, in which are formed the longitudinal and vertical openings M, in which rest spiral springs N. Over this rib L are placed the bucket wings O which are placed together by a tongue and groove so that they will move endwise in relation to one another, and these wings are operated by the spiral springs N so as to cause them to move endwise or outward so that they bear against the surface of the casing.

In the central web E are formed recesses P, on each side thereof, having packing rings Q therein which are held outwardly by means of the small coil springs R, and these rings bear against the sides of the wheels G which prevents any leakage of the steam.

The ends S of the cylinder are secured to the casing by means of the bolts T passing over the casing and into the flanged edges of the ends. In these ends are formed recesses U in which are placed packing rings V, which are held outwardly by means of small coil springs W so that the rings bear against the sides of the wheels G and act similar to the packing rings Q in the central web E.

Mounted upon the casing C is a steam chest X having the valves Y therein which are connected by levers Z and A' to the rocker arms B' of the shaft C', said shaft being mounted in suitable bearings D'. Mounted upon the shaft to similar rocker arms E' are the eccentric levers F' which are connected to the eccentrics G' on the shaft B whereby the valves are operated as the shaft is revolved and the eccentric for the different valves is caused to reciprocate it in the chest to close the curved port or ports H' therein. These eccentrics are so mounted on the shaft to correspond to the wheels that the valve begins to close or closes the port H' before the buckets H on the wheels reach the exhaust port I' in the casing.

Gate valves J' are mounted on the casing just ahead of the steam chest and are received in a suitable casing K' said casing having vertical tubes L' threaded therein,

in the upper ends of which are placed the plugs M', or in place of these plugs lubricating cups may be mounted therein. Resting upon the tops of the gate valves are the rods N' which extend upward into the tubes L' and have coiled about them coil springs O', the lower ends of which rest against the upper portion of the gate valves and the upper ends against the plugs M' threaded into the tubes L'. These plugs may be of any desirable length so that they can be threaded into the tubes a considerable distance thereby tightening the spring so that the gate valves J' will be caused to tightly bear against the wheels G, and as the wheels are rotated after passing the exhaust port I' and the port H' when the steam chest is closed by one of the valves therein, it strikes a bucket H on the wheel causing it to move upward, and as the bucket passes from beneath it, it strikes the sloping surface J and gradually moves downward until it becomes seated on the surface of the wheel and the valve Y is drawn from the port H', and as the steam is permitted to strike the bucket and force the wheel onward these gate valves preventing the steam from passing but in one direction through the cylinder and always causing the wheel to move.

The operation of the device is as follows: Steam is admitted from a boiler to the cylinder causing the wheel or wheels to revolve and they are so timed that the bucket H on one is at the top, or near the gate valve when the other is making its revolution and is about midway thereof, the pressure of steam against the wheels causing the shaft B to revolve transmitting motion to the fly wheels and to the eccentrics, which eccentrics are connected to the eccentric levers, and these are connected to the rocker arms on the shaft C' thereby transmitting motion to the rocker arms B' which in turn are connected to the levers A' and Z, said levers operating the valves Y. The eccentrics do not run together but permit one lever to transmit motion to the shaft C' to cause one of the valves Y to operate and cover the port H', as the bucket H on the wheel G passes the exhaust port I' thereby closing the supply to this wheel, and as the wheel passes around it strikes one of the gate valves J' causing it to rise upwardly against the action of the coil springs O' and as the bucket passes from beneath it the springs cause the valve to again become seated on the rim of the wheel, and after it passes the gate valve and has traveled a short distance the valve Y is drawn from the port H' allowing the steam to strike against the back of the bucket forcing the wheel around as the other valve is closing the other port by the other wheel which is now reaching the exhaust valve E; at the same time the steam is entering the port and forcing the first

named wheel around thereby preventing the loss of motion or stroke, and the strain naturally due to the jerking motion as an even stroke is always given to the machinery. As the packing rings Q and V are constantly pressing against the sides of the wheels G it prevents any of the steam passing outside of the space left between the periphery of the wheels and the inner sides of the cylinder.

Of course I do not wish to be limited to the exact details of construction here shown, as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention what I claim as new and useful, is—

1. In a rotary engine, the combination with a frame, a casing mounted on the frame and having exhaust ports therein, of a shaft, wheels mounted on said shaft, buckets having grooves therein on said wheels, spring actuated wings mounted within the grooves in the buckets adapted to bear against the casing, valves for regulating the flow of steam to the wheels, means for actuating the valves alternately, spring actuated gate valves for preventing the flow of steam in more than one direction through the casing, and means for regulating the tension of said springs.

2. In a rotary engine, the combination of a frame, a casing having a central web mounted on the frame, said web having circular grooves formed therein, spring actuated packing rings mounted in said grooves, a shaft, wheels within the casing on both sides of the central web mounted on the shaft, buckets on the wheels, spring actuated wings mounted in said buckets, a steam chest mounted on the casing having ports therein for the admission of steam to the casing, valves in the chest for regulating the flow of steam to the wheels, means connected to the shaft for operating the valves, another casing formed with the first named casing, gate valves having rods resting on their upper ends mounted in said casing, tubes extending from the top of said casing, coil springs, and means for adjusting the tension of said springs.

3. In a rotary engine, the combination of a frame, a casing having a central web mounted on the frame, said web having circular grooves formed therein, spring actuated packing rings mounted in said grooves, a shaft, wheels within the casing on both sides of the central web mounted on the shaft, buckets on the wheels, spring actuated wings mounted in said buckets, a steam chest mounted on the casing having ports therein for the admission of steam to the casing, valves in the chest for regulating the flow of steam to the wheels, means connected to the shaft for operating the valves, another casing formed with the first named casing,

gate valves having rods resting on their upper ends mounted in said casing, tubes extending from the top of said casing, coil springs coiled about the rods mounted on the gate valves and extending upward into the tubes, plugs threaded in said tubes for adjusting the tension of said springs, casing ends having circular grooves formed therein, and spring actuated packing rings

mounted in said grooves adapted to bear against the sides of the wheels.

In testimony whereof, I have hereunto affixed my signature in the presence of two subscribing witnesses.

WILLIAM M. SPENCER.

Witnesses:

R. F. SEARS,

H. A. HUTCHENAN.