

(No Model.)

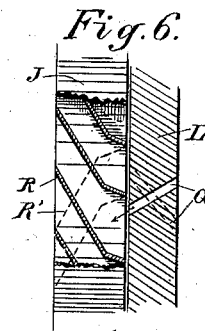
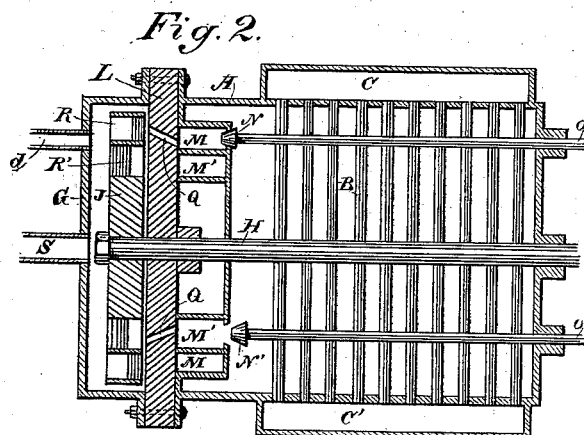
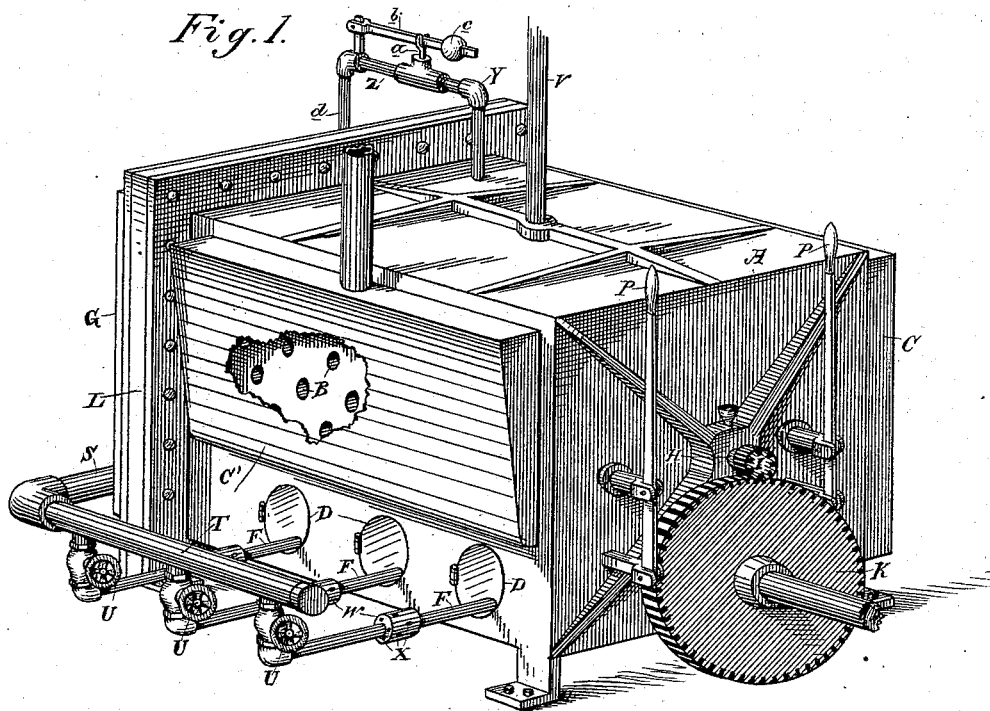
2 Sheets—Sheet 1.

R. HEWSON.

ROTARY VAPOR ENGINE.

No. 382,424.

Patented May 8, 1888.



Witnesses,
Geo. L. Strong.
J. H. Sturges.

Inventor,
Robt Hewson.
By Dewey & Co. atty

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Fig. 3.

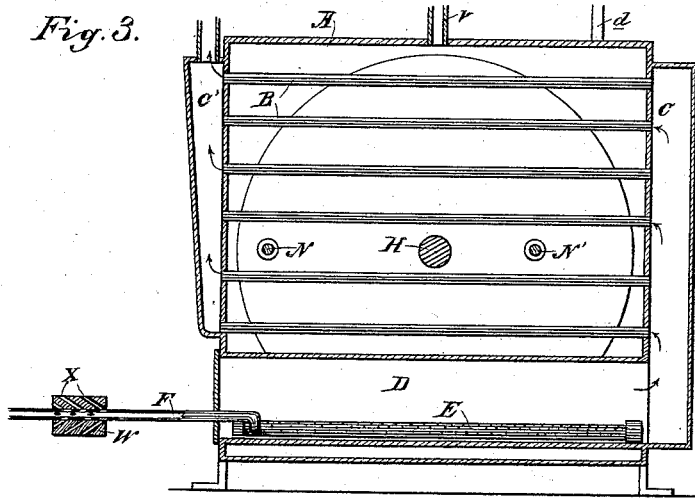


Fig. 4.

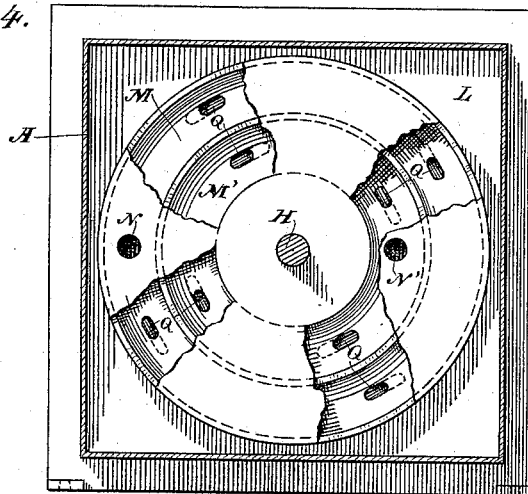
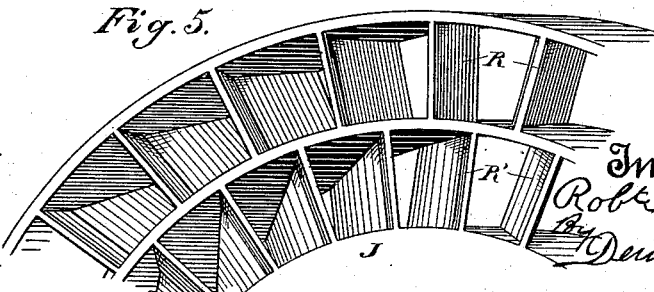


Fig. 5.

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UNITED STATES PATENT OFFICE.

ROBERT HEWSON, OF SAN FRANCISCO, CALIFORNIA.

ROTARY VAPOR-ENGINE.

SPECIFICATION forming part of Letters Patent No. 382,424, dated May 8, 1888.

Application filed November 19, 1887. Serial No. 255,669. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HEWSON, of the city and county of San Francisco, State of California, have invented an Improvement in Rotary Vapor-Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel engine in which vapor or gas under pressure is employed as a motor.

It consists of a vaporizing chamber or generator into which gasoline or other easily-vaporized and preferably inflammable substance is admitted, and where it is converted into a vapor or gas, valves and gates by which the escape of this vapor or gas is controlled, and a peculiarly-constructed wheel, journaled so as to rotate in close proximity with the discharge-openings from the generator, together with details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my apparatus with a portion of one of the end chambers broken away to show the tubes. Fig. 2 is a horizontal section taken through the apparatus, showing the valves, the inlet-ports, and the rotary wheel. Fig. 3 is a vertical section taken through the boiler and one of the heating furnaces. Fig. 4 is a view of the diaphragm, showing the inlet-port. Fig. 5 is a view of a section of the wheel, showing the construction by which it may be driven in either direction. Fig. 6 shows the action of the steam on the wheel.

A is a boiler or generator, which may be made of any suitable or desirable shape. In the present case for convenience I have shown it as made rectangular with the sides suitably braced or stayed to resist internal pressure. Through this generator from one side to the opposite one extend a series of flues or tubes, B, and at the opposite ends are the chambers C C', through which the products of combustion pass, entering the rear chamber from the furnace D in the lower part of the generator and returning thence through the tubes B to the chamber C' at the front, from which they are allowed to escape into the open air or into a chimney, as may be desired. I have shown the furnaces in the form of cylinders or tubes of considerable diameter extending through

the lower part of the generator, and within these tubes are pipes E, which are thickly perforated with small holes. Into these pipes the feed or supply pipes F enter and discharge the vapor or gas into their interior, so that it may escape through the numerous perforations and be ignited from the outside, thus filling the interior of the furnaces with a volume of flame which will soon vaporize the contents of the generator.

G is a chamber or casing at one side of the generator, having the shaft H, which in the present case extends through the generator transversely to the tubes B and through the opposite side of the case, where it has a pinion or belt-pulley fixed upon it, from which power may be transmitted to a gear-wheel or pulley, K, as shown in Fig. 1. The wheel J rotates in close proximity to a wall or diaphragm, L, which is interposed between the wheel-casing and the generator. Upon the opposite side of this wall from the wheel are two close annular chambers, M and M', which are secured to or cast as a part of the diaphragm. These chambers have valves N N' and valve-stems O, by which they are actuated. They are shown in the present case as extending through the generator transversely to the flues and parallel with the shaft H, and they are moved by levers P, so that either one or the other of these valves may be opened to admit the gas or vapor from the generator into the annular chambers M or M', and from these chambers it passes through the openings or passages Q, which are made diagonally through the diaphragm L, as shown.

The wheel J is made with two concentric sets of buckets, R and R', these buckets being peculiarly shaped, so that reactionary force of the vapor striking them will cause the wheel to rotate. The outer set of buckets, R, is set at one angle, so as to receive the impact of the vapor from the diagonally-arranged passages Q, which open from the annular chamber M, and this causes the wheel to rotate in one direction. If it is desired to reverse the rotation of the wheel, the valve N, which opens the chamber M, is closed and the valve N', which opens the chamber M', is opened, so as to admit the vapor or gas to strike the buckets R', which are inclined in an opposite direction from the buckets R.

This causes the wheel to rotate in an opposite direction. As the vapor or gas escapes through the wall in the outer portion of the chamber G, it passes out through a pipe, S, and is conveyed by it into a pipe, T, which extends across the front of the furnace. This pipe serves as a sort of reservoir or supply from which the gas or vapor is admitted into the pipes F, leading to the furnace, by means of valves or cocks U. By this construction the gas or vapor, after it has been exhausted through the wheel, is led directly into the furnaces, and is employed as a fuel to vaporize the liquid which is fed into the generator through the pipe V. This liquid, which may be gasoline or other hydrocarbon, is pumped in by means of a pump driven by the engine, and not here shown.

In order to regulate the air-supply and mix as much air with the vapor as may be desirable for the best heating effects, I have shown a sleeve or collar, W, fitted upon each of the feed-pipes F. These collars have each a number of inclined openings, X, made in them extending from the outside to the center, and corresponding holes are made in the pipes F, so that as the vapor is forced through the pipes F and into the combustion-chambers E a certain proportion of air will be drawn in through the inclined openings X and mixed with the vapor, so as to increase its combustion and heating capacity. The amount of air admitted is regulated by turning the sleeve W so as to carry the holes X more or less out of line with the holes in the pipes F, and, if desired, they may be turned so far as to entirely cut off the air-supply and close the holes altogether, thus forming a simple and easily-regulated apparatus.

Y is a pipe leading upward from the top of the generator and having a safety-valve in the transverse portion Z. The stem *a* of this valve extends upward through a hole in the top of the valve-chamber Z, and a lever, *b*, with a weight, *c*, serves to regulate the pressure which is maintained within the generator. Whenever the pressure becomes too great and the safety-valve is opened, the escaping vapor passes through a pipe, *d*, which leads it directly into the outer part of the wheel-chamber G, and from this it may pass through the pipe S and thence to the furnace, as desired. This construction gives me a very compact and easily-controlled apparatus.

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

1. The generator having the annular chambers M M and perforated diaphragm upon one side, valves by which vapor or gas under pressure may be admitted into the chambers from the generator, and a reactionary wheel journaled so as to rotate in close proximity with the perforated diaphragm, substantially as herein described.

2. The generator or boiler having the wheel-casing and perforated diaphragm upon one side, a wheel having concentric sets of buckets standing in opposition to each other, and corresponding annular chambers formed upon the back of the perforated diaphragm and communicating with the openings therein, in combination with the valves whereby the gas may be admitted into these annular chambers from the generator and thence delivered to either set of wheel-buckets, so as to drive the wheel in either direction, substantially as herein described.

3. The reversible reactionary wheel consisting of the two sets of buckets set reversely to each other and concentrically, one set within the other, substantially as and for the purpose herein described.

4. The generator, wheel-case, perforated diaphragm, annular chambers, and double reactionary wheel, in combination with the discharge-pipe connecting with the wheel-case, and pipes leading therefrom to the generator furnace or furnaces and having controlling-valves, substantially as herein described.

5. The generator having the double reactionary wheel journaled within the wheel-case at one side, the annular chambers, and intermediate perforated diaphragm through which vapor under pressure may be discharged from the generator upon the wheel, in combination with the valves, valve-stems, and controlling hand-levers, substantially as herein described.

6. The generator having the furnaces and return-flues extending through it from one end to the other, having a double reactionary wheel contained within a wheel-case upon one of the sides, a double perforated diaphragm with annular connecting-chambers and controlling-valves, and a discharge-pipe connecting with the wheel-case and having pipes leading therefrom into the furnaces, substantially as herein described.

In witness whereof I have hereunto set my hand.

ROBERT HEWSON.

Witnesses:

S. H. NOURSE,
J. H. BLOOD.