

No. 713,443.

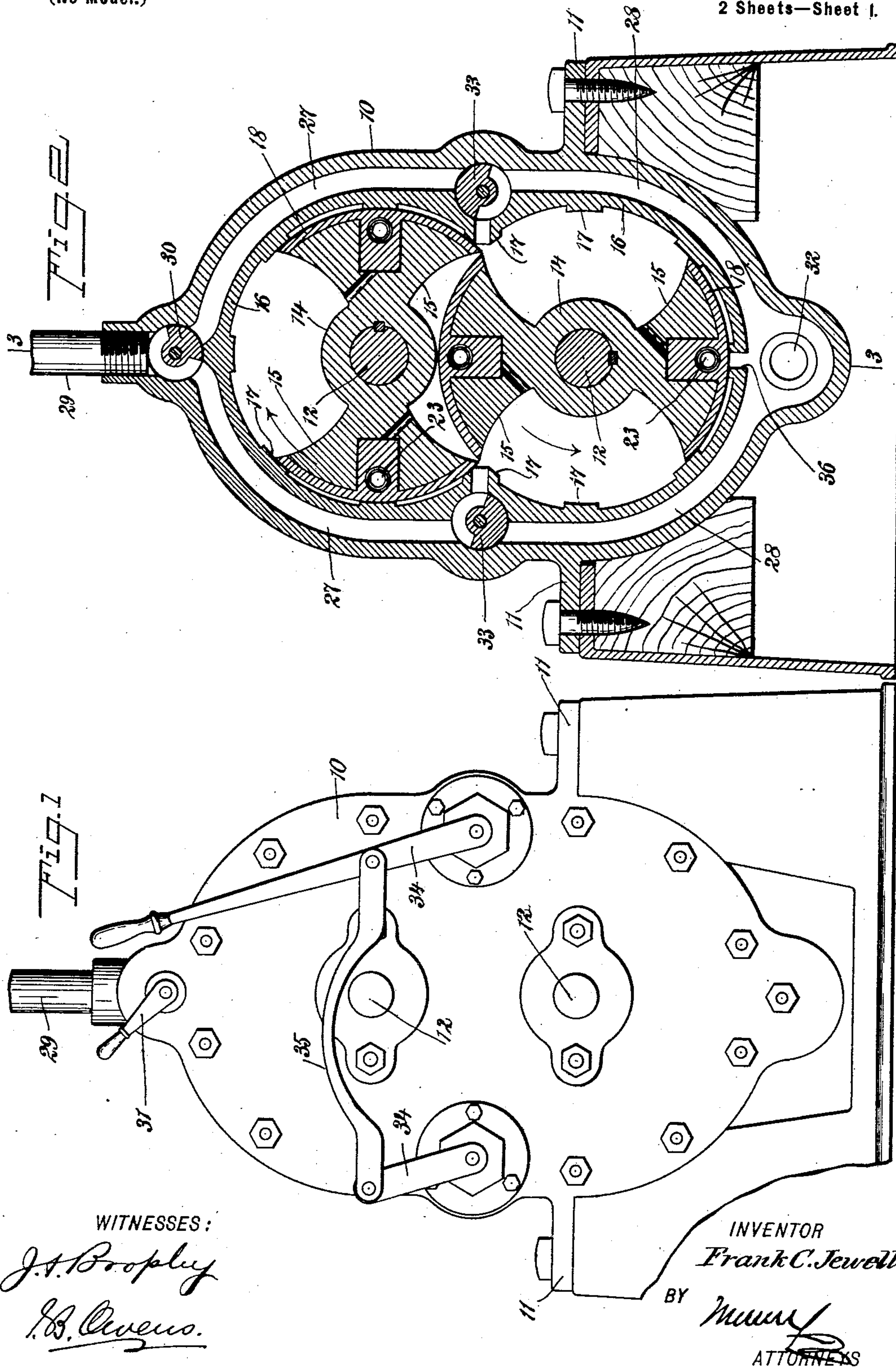
Patented Nov. 11, 1902.

F. C. JEWELL.
ROTARY ENGINE.

(Application filed Dec. 17, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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H. B. Owens.

INVENTOR

Frank C. Jewell

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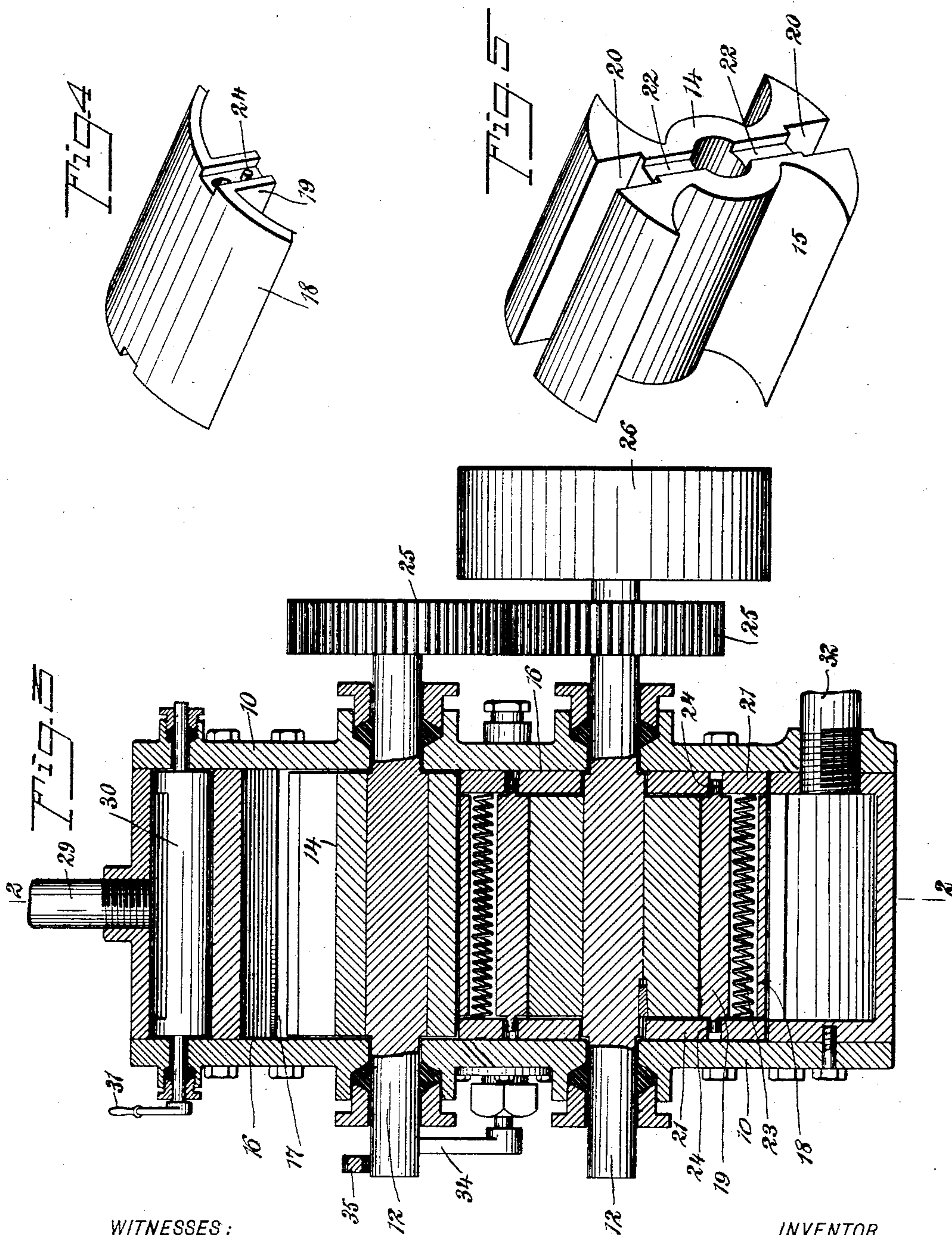
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UNITED STATES PATENT OFFICE.

FRANK CHARLES JEWELL, OF SEATTLE, WASHINGTON.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 713,443, dated November 11, 1902.

Application filed December 17, 1901. Serial No. 86,206. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHARLES JEWELL, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

This invention relates to a rotary engine having two intermeshing pistons operating in connection with certain peculiar devices for controlling the supply and admission of steam, as will be fully described hereinafter.

This specification is a specific description of one form of the invention, while the claims are definitions of the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an end view of the invention. Fig. 2 is a section thereof on the line 2 2 of Fig. 3. Fig. 3 is a section on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of one of the peripheral packing-plates for the piston; and Fig. 5 is a detail perspective view of one of the pistons, showing the packing removed.

The engine has an exterior casing 10, with side lugs 11 for mounting it on the bed, which may be of any suitable form. Mounted in the casing are two parallel shafts 12, respectively, carrying the pistons 14. These pistons comprise hub or body portions with sector-like wings 15, the outer peripheries of which are curved concentrically to the shafts 12. The pistons are arranged so that their portions 15 intermesh during the rotation of the pistons, and the pistons are located, respectively, in circular chambers 16, formed in the casing 10, these chambers communicating with each other, so as to allow the proper coaction of the pistons. The interior walls of the chambers 16, against which the peripheries of the pistons work, are formed with transverse ribs 17, which are engaged by the working surfaces of the pistons to the exclusion of the other portions of the chamber-walls. This reduces the friction incident to the movement of the pistons, since it reduces the surface with which

the pistons contact. The pistons are provided with peripheral packing-plates 18, (best shown in Fig. 4,) which have inwardly-extending radial portions 19, fitted in grooves 20 in the pistons. (See Fig. 5.) The pistons also have side packing-plates 21, (see Fig. 3,) which fit inside grooves 22 in the pistons. (See Fig. 5.)

23 indicates springs which are mounted in transverse passages in the peripheral packing-plates 18 and which press the side packing-plates 21 into operative position. The radial parts 19 of the packing-plates 18 have pins 24, which fit in orifices in the side packing-plates 21, so as to hold these parts together. It will be observed that by these devices the pistons are packed against the walls of the chambers 16, and leakage of steam is prevented. As shown in Fig. 3, the shafts 12 of the two pistons are connected together by gears 25, and 26 indicates a pulley from which the motive power of the engine may be taken.

The casing 10, as best shown in Fig. 2, is formed with steam-feed passages 27 at each side, these passages leading from the top of the casing down around the sides of the upper chamber 16. Around the sides of the lower chamber 16 steam-exhaust passages 28 are formed, similar to the passages 27.

29 indicates the steam-supply pipe, and 30 the throttle-valve, which is located at the juncture of the two passages 27 at the upper part of the casing 10. This valve may be thrown to cut off the steam from both passages or to throw the steam into one passage to the exclusion of the other.

In Figs. 1 and 3, 31 indicates a handle for operating the valve 30. 32 indicates the exhaust-pipe, leading from the juncture of the two passages 28 at the bottom of the casing 10. The feed-passages 27 and exhaust-passages 28 at each side of the casing 10 are separated from each other by oscillatory valves 33, which are mounted transversely in the casing 10 at the vertical middle thereof, one at each side. These valves are adapted to be operated in unison by means of arms 34, connected by a link 35. (See Fig. 1.) The valves 33 are of such form and arrangement that they may be thrown to cause the steam

to enter the piston-chambers at one side or the other of the casing, thus driving the engine in one direction or the other. As shown in Fig. 2, the left-hand valve is open and the right-hand valve is closed. This causes the steam to pass down the left-hand port 27 and act against the left-hand sides of the pistons, thus turning them in the direction of the arrows. The exhaust-steam passes out by way of the right-hand valve 33, which is thrown to connect the piston-chambers with the right-hand exhaust-passage 28.

At the bottom of the lower chamber 16, just above the exhaust-passage 32, is formed a port 36, which establishes direct communication between this lower chamber 16 and the exhaust. The purpose of this port is to permit the passage of the steam from the lower chamber 16 directly into the exhaust-port. At the period of exhaust the steam from the upper chamber 16 will pass by way of the valve 33, which is connected with the exhaust, (in Fig. 2 the right-hand valve.) When the lower piston opens the port 36, the major portion of the steam in the lower chamber 16 will then pass out into the exhaust. This effects a thorough exhaust and greatly relieves the exhaust-ports proper. It also relieves the volume of steam in the working exhaust-passage 28, which has the result of facilitating the entire exhaust of the upper chamber 16.

Assuming the parts to be in the position shown in Fig. 2 and the piston moving in the direction of the arrows, the steam passing by way of the left-hand valve 33 will act on the pistons to continue their movement, the passage of the steam through the engine being continuous and the parts running when under proper pressure at a relatively high speed. The engine may be made single or compound, as will be obvious to persons skilled in the art. The drawings show the single form of the engine. One of the arms 34 is extended to form a handle, and by throwing this handle from one position to another the engine may be quickly reversed, while it may be started or stopped at will by manipulation of the valve 30.

Various changes in the form and details of my invention may be resorted to at will without departing from the spirit of my invention. Hence I consider myself entitled to all forms of the invention as may lie within the intent of my claims.

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

1. A rotary engine, having a casing with two communicating chambers formed therein, interengaged rotary pistons mounted respectively in the chambers, the casing also having steam-feed passages extending from the top down opposite sides thereof and steam-exhaust passages extending from the feed-passages down opposite sides of the casing to

the bottom thereof, said feed and exhaust passages communicating with the casing intermediate its ends, and the lower chamber of the casing having a relief-port directly adjacent to the juncture of said exhaust-passages, and valves mounted at the junctions of the feed and exhaust passages to control the passage of steam to and from the piston-chambers.

2. A rotary engine, having a casing with two communicating piston-chambers therein, said casing also having exhaust-passages extending from the juncture of the piston-chambers down opposite sides of the casing to the bottom thereof, valves commanding said exhaust-passages, and interengaged pistons working respectively in the piston-chambers, the casing further having a relief-port extending from the lower piston-chamber into the exhaust-passages at the juncture thereof.

3. A rotary engine, having a casing with two communicating chambers formed therein, interengaged rotary pistons mounted respectively in the chambers, the casing also having steam-feed passages extending from the top down opposite sides thereof, and steam-exhaust passages extending from the feed-passages down opposite sides of the casing to the bottom thereof, said feed and exhaust passages communicating with the casing intermediate its ends and the lower chamber of the case having a relief-port communicating with the exhaust-passages, and valves mounted at the junctions of the feed and exhaust passages, for the purpose specified.

4. A rotary engine having a cylinder and a piston, and a piston-packing comprising a peripheral packing-plate lying over the working face of the piston and adapted to run against the walls of the cylinder, a radial part attached to said peripheral plate and fitted in the piston, side packing-plates lying against the sides of the piston respectively adjacent to the ends of the peripheral packing-plate, the said radial portion having grooves in the ends thereof and the side packing-plates extending into said grooves, and a spring fitted in the said radial portion of the packing and pressing the side plates outward.

5. A rotary engine, comprising a casing with two communicating piston-chambers therein, the casing also having feed-passages in its walls, such passages extending from the top of the casing down opposite sides thereof and communicating with the piston-chambers at points directly adjacent to the junction of said chambers, the casing also having exhaust-passages within its walls, the exhaust-passages extending from the lower ends of the feed-passages down opposite sides of the casing to the bottom thereof, valves located in walls of the casing at the junctions of the feed and exhaust passages at each side of the casing to control the admission and emission of steam, a throttle-valve located in the walls

of the casing at the top thereof and at the
juncture of the feed-passages, said valve
commanding the steam communication with
one feed-passage or the other, and interen-
5 gaged pistons mounted respectively in the
piston-chambers.

In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

FRANK CHARLES JEWELL.

Witnesses:

JAS. E. MCGREW,
PHIL. WAHL.