

No. 890,793.

PATENTED JUNE 16, 1908.

J. C. PFEIFFER.
ROTARY ENGINE.
APPLICATION FILED MAY 20, 1907.

2 SHEETS—SHEET 2.

Fig. 3.

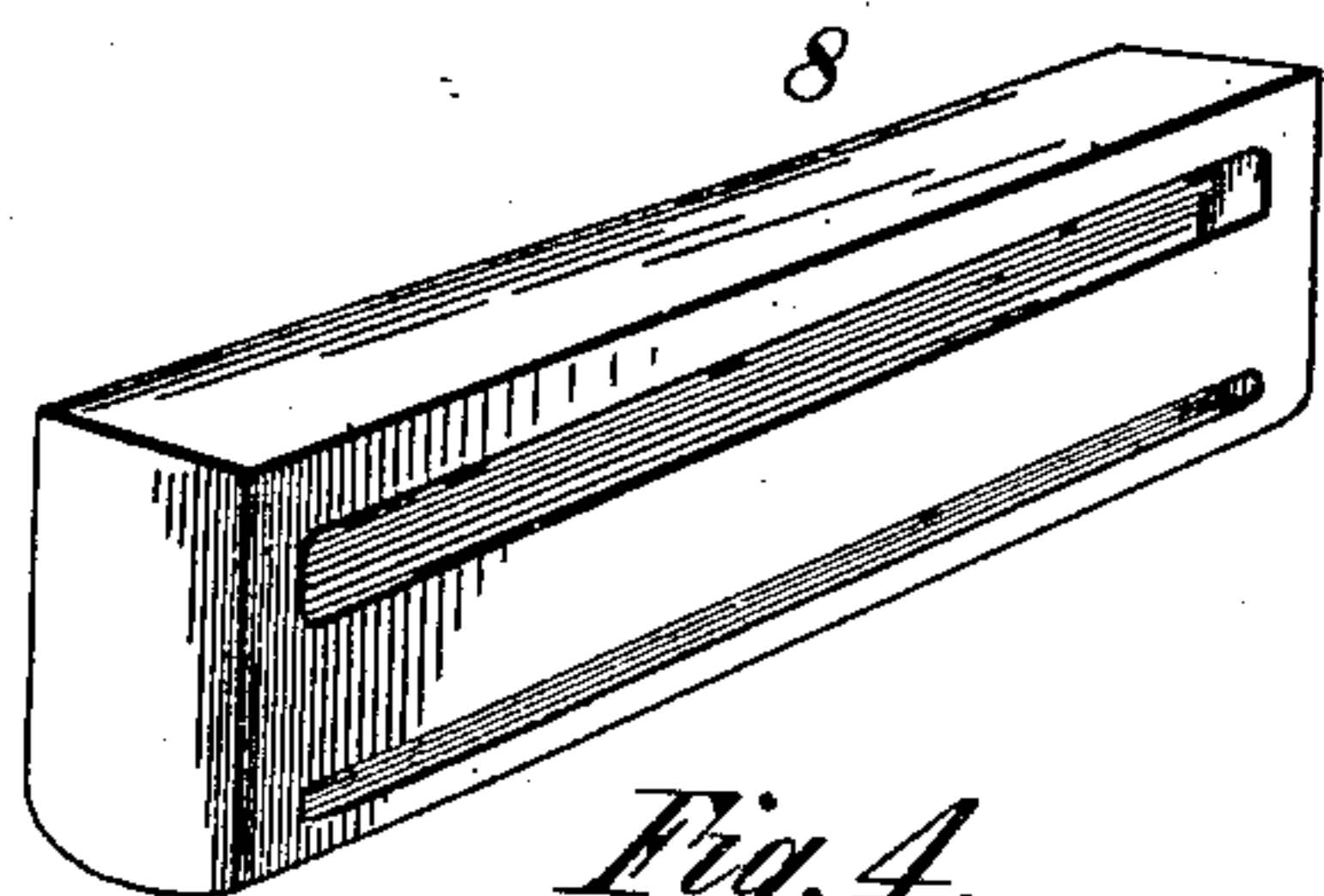
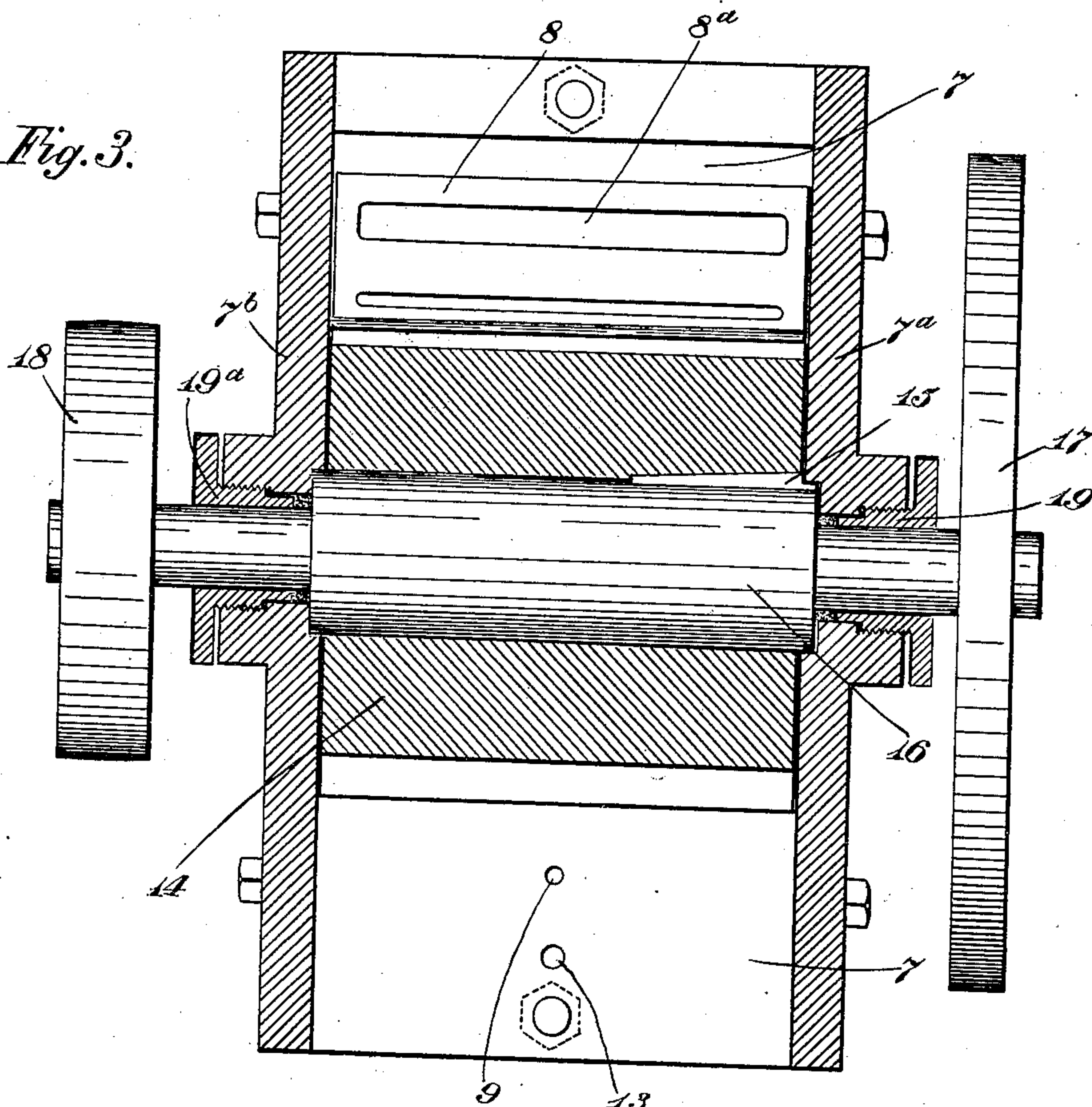


Fig. 4.

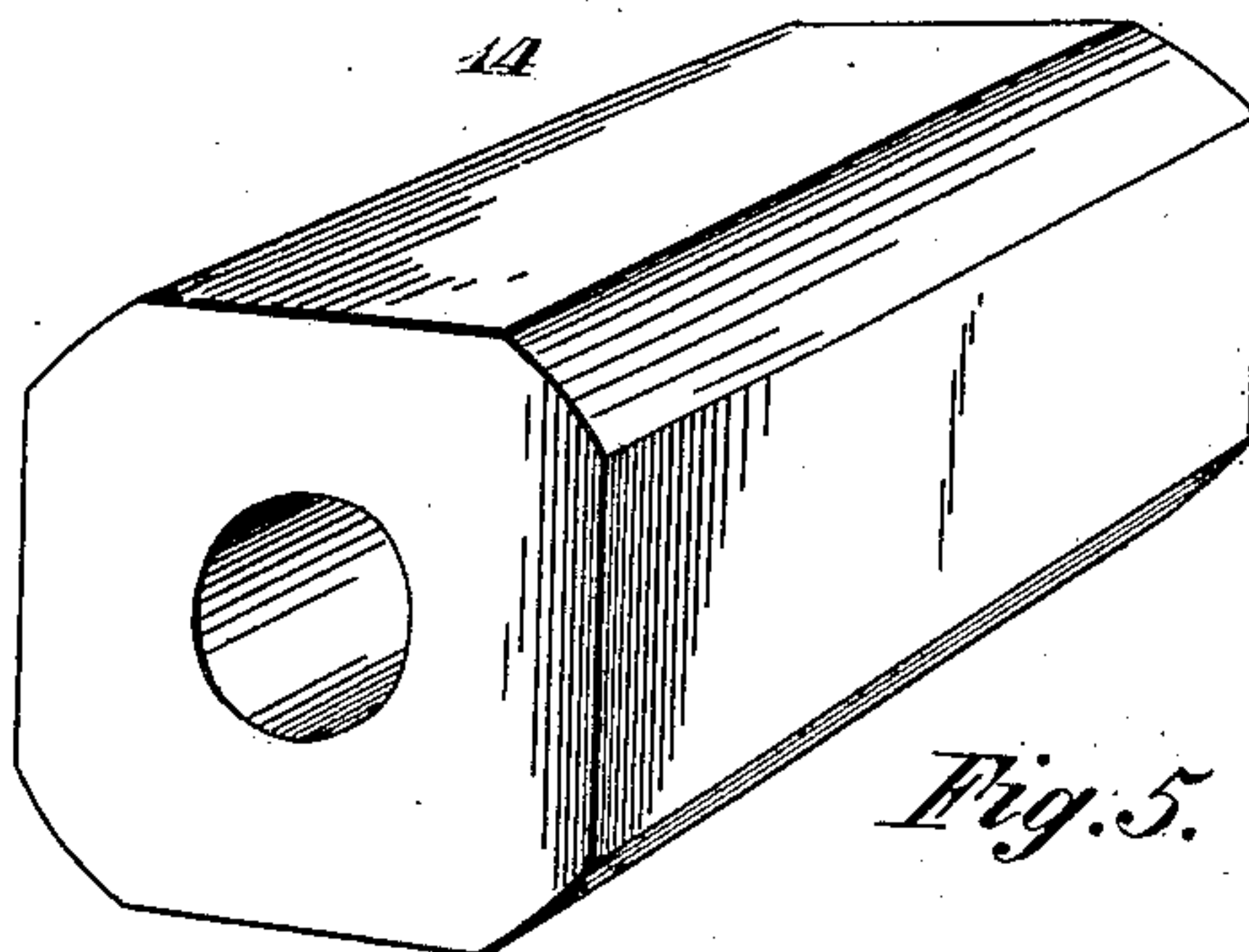


Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

No. 890,793.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed May 20, 1907. Serial No. 374,553.

To all whom it may concern:

Be it known that I, JOSEPH C. PFEIFFER, a citizen of the United States, residing at East Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Rotary Engines, of which the following is a specification.

The object of this invention is to provide a simplified and improved construction of engine of the kind stated, in which the expansive force of the operating fluid is more largely utilized and in which the volume of fluid required is reduced without diminishing the area presented for effective operation.

The invention resides in the construction hereinafter described and claimed, one embodiment thereof being shown in the accompanying drawings.

In said drawings—Figure 1 is a vertical section showing the piston at the position where the operating steam is about to be cut off; Fig. 2 is a similar section showing the piston at the position where the steam is first admitted; Fig. 3 is a section at right angles to that on which Figs. 1 and 2 are taken but on the lines $x-x$ Fig. 1; Fig. 4 is a perspective of the valve; Fig. 5 is a perspective view of the piston.

The cylinder is made up of four similar suitable sections 6 bolted together to provide an interior chamber of cylindrical form and with four equidistantly-located radiating valve chambers and seats, as seen at 7. The sections 6 are bolted to suitable heads 7^a and 7^b that have downward projections to constitute standards for bolting the engine to a floor. As the four valves and the steam-supply and exhaust constructions therefor are alike a description of one will suffice for each.

8 designates the valve. This valve is of bar form and is provided with flat smooth faces to work over the faces of the seats of the valve chambers and a rounded inner edge against which the piston acts. The valve 8 is provided at the right-hand side, as designated in Figs. 1 and 2, with a steam-supply passage 8^a, and at the left-hand side with a corresponding exhaust passage 8^b.

The character 9 designates the steam-supply port in the engine casing and 10 designates the corresponding exhaust port. The outer ends of the steam passages 8^a and 8^b in the valve are made of larger diameter than the terminals of the ports 9 and 10 so as to provide a full opening of the valve passages when the valve is at its inward positions.

11 designates the pipe for supplying the operating steam and 12 a pipe for carrying away the exhaust, although this latter is not a necessary feature so far as the principle of the machine is concerned.

13 designates a small pipe or passage branched from the pipe 11 for conducting steam and its pressure to the valve chamber beyond the outer edge of the valve, said pressure tending to hold the valve inward against the piston.

14 designates the piston. This piston is made generally of rectangular form in cross section but with rounded corners conforming in their curvature to the inner surface of the cylinder proper. The piston is keyed by a suitable key 15 to a suitable shaft 16 that is journaled in the heads 7^a and 7^b. The shaft 16 extends through the said heads and its projecting extremities are furnished with the usual fly and belt wheels 17 and 18 respectively. The shaft where it extends through the heads 7^a and 7^b is provided with suitable stuffing boxes 19 and 19^a for securing steam-tightness. Indeed, all connected parts can be provided with ordinary packings to secure steam-tightness where this is important.

It will be observed that by reason of the rectangular form of the piston the steam space between it and the surface of the cylinder is small but this fact, it will be noted, does not diminish the effective area presented for the steam pressure, this being measured on the radius from the axis of the shaft of the piston. It will also be observed that the faces of the piston afford a gradual or inclined approach to the curved corners of the piston, hence the action of said faces in moving the valves outward against their pressure inward is gradual and wedge-like.

If the parts are in the position shown in Fig. 2 the engine would automatically start on the admission of steam, but if it should happen that the engine stopped with the curved corners directly under the valves a slight movement of the fly-wheel to the right will carry the piston into position to be moved by the pressure of the steam. As the piston rotates, the valves are reciprocated in their chambers, the piston moving them outward and the steam pressure through the pipe 12 inward. This reciprocation of the valves effects an opening and closing of the inner terminals of the passages in the valves, the closing being only momentary and at

the time when the curved corners of the piston are in line with the valves, but the expansion of steam aided by the momentum of the fly-wheel will carry the piston beyond
5 such position so that pressure on the piston and its motion will be practically constant and uninterrupted.

It will be observed that the pressure on the valves is greater when the piston is in the
10 position shown in Fig. 2 than when in the position shown in Fig. 1, hence said pressure assists to some extent in moving the piston when in first named position.

Arrows are placed on Figs. 1 and 2 to indicate the direction of motion of the piston
15 and also the direction of flow of the supply and exhaust steam.

What I claim and desire to secure by Letters Patent is:

20 1. In a rotary engine, the combination of the cylinder structure having at its outer part radially extending valve chambers having flat valve seats and supply and exhaust passages opening at said seats, a rotary piston in said cylinder of polygonal form in
25 cross section and having rounded corners working on the inner sides of the cylinder, a

radially reciprocating valve in each of said valve chambers, said valves each having a supply and an exhaust port each open at its
30 ends only, said ports cooperating respectively with the supply and exhaust passages of the valve seats, substantially as described.

2. In a rotary engine, the combination of the cylinder structure having at its outer
35 part radially extending valve chambers having flat seats and supply and exhaust passages opening at said seats, a rotary piston in said cylinder of polygonal form in cross section and having rounded corners working on
40 the inner sides of the cylinder, a radially reciprocating valve in each of said valve chambers, said valves each having a supply and an exhaust port each open at its ends only, said
45 ports cooperating respectively with the supply and exhaust passages of the valve seats, and a branch passage 13 leading from the supply into the outer portion of the valve chamber beyond the valve, substantially as
described.

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Witnesses:

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