

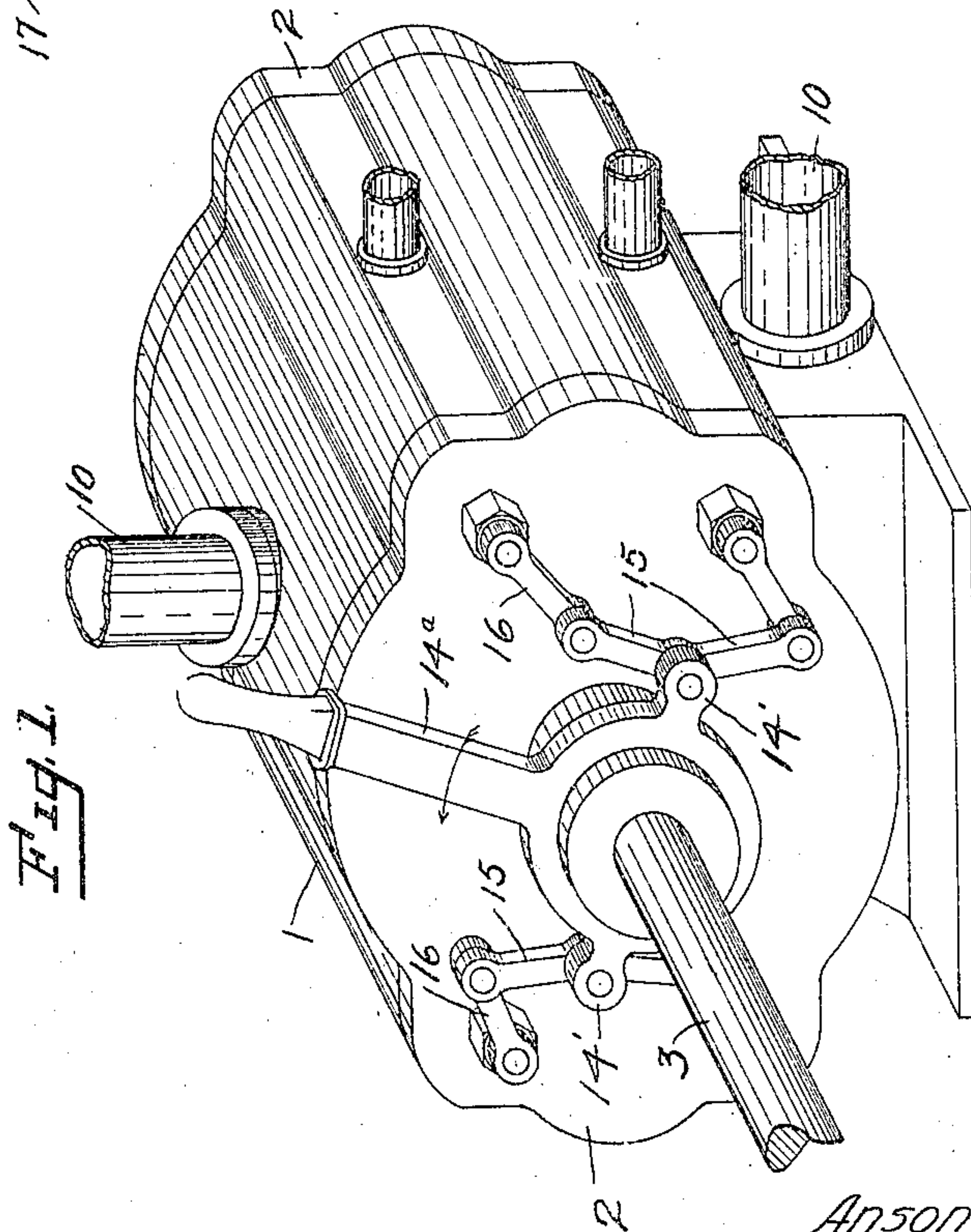
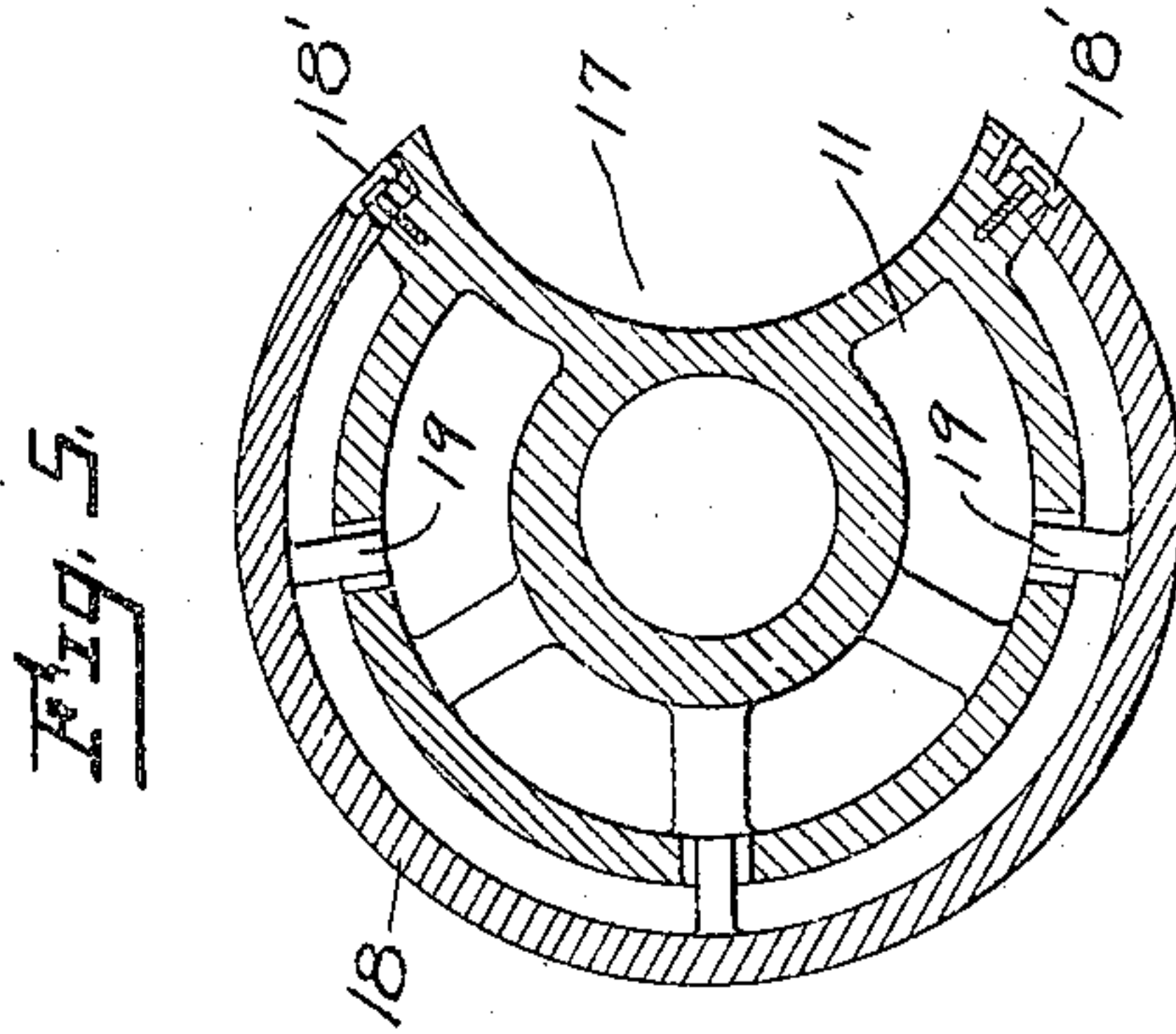
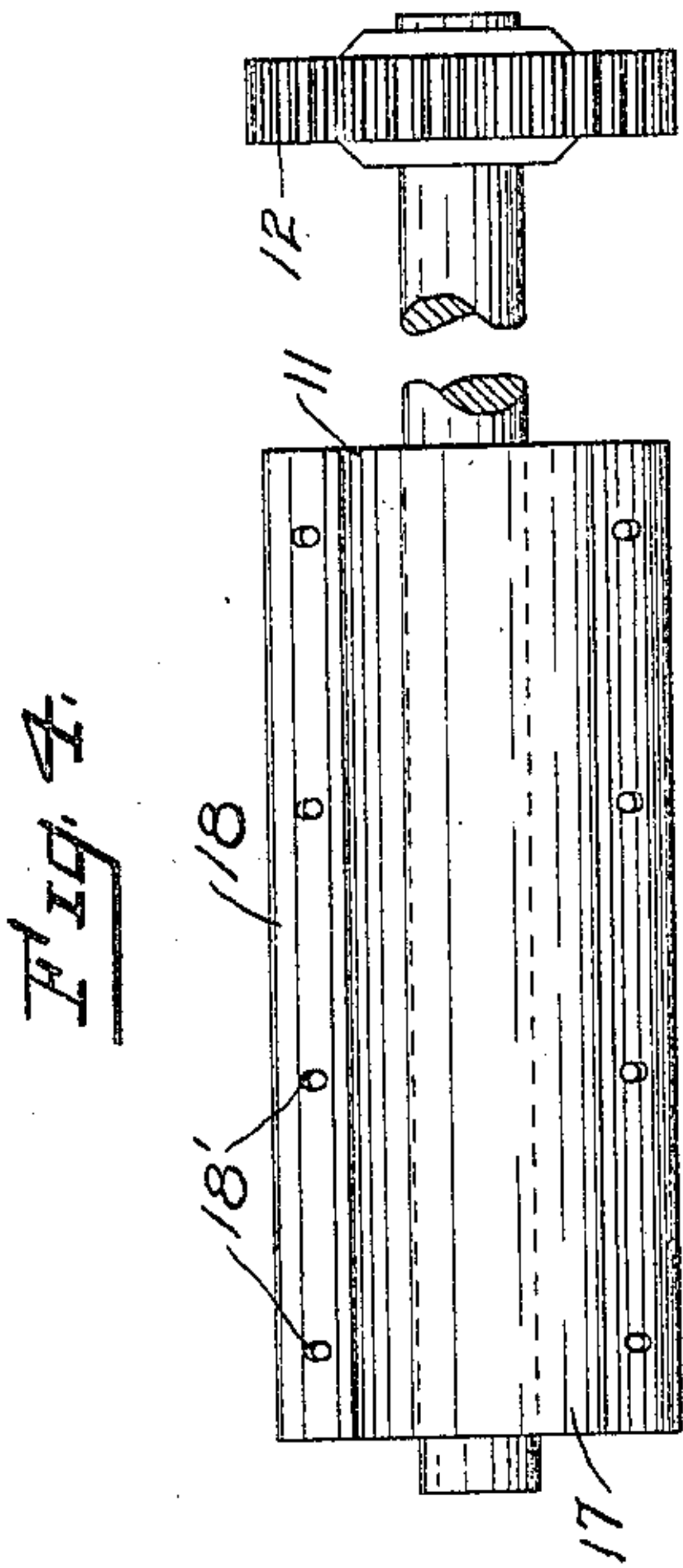
No. 822,378.

PATENTED JUNE 5, 1906.

A. S. LEVAKE.
ROTARY ENGINE.

APPLICATION FILED JULY 31, 1905.

2 SHEETS—SHEET 1.



Witnesses
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Edward W. Cressman.

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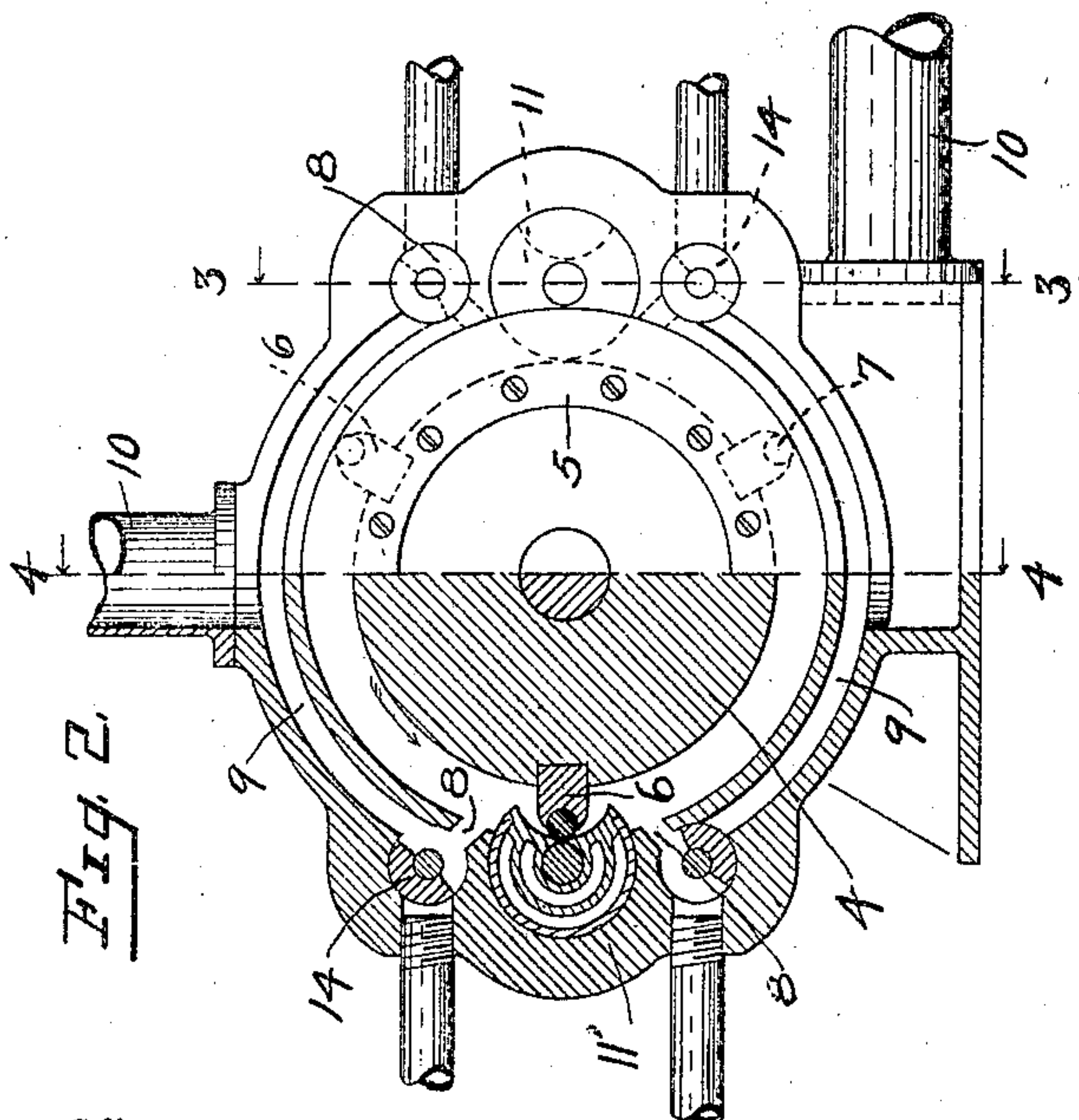
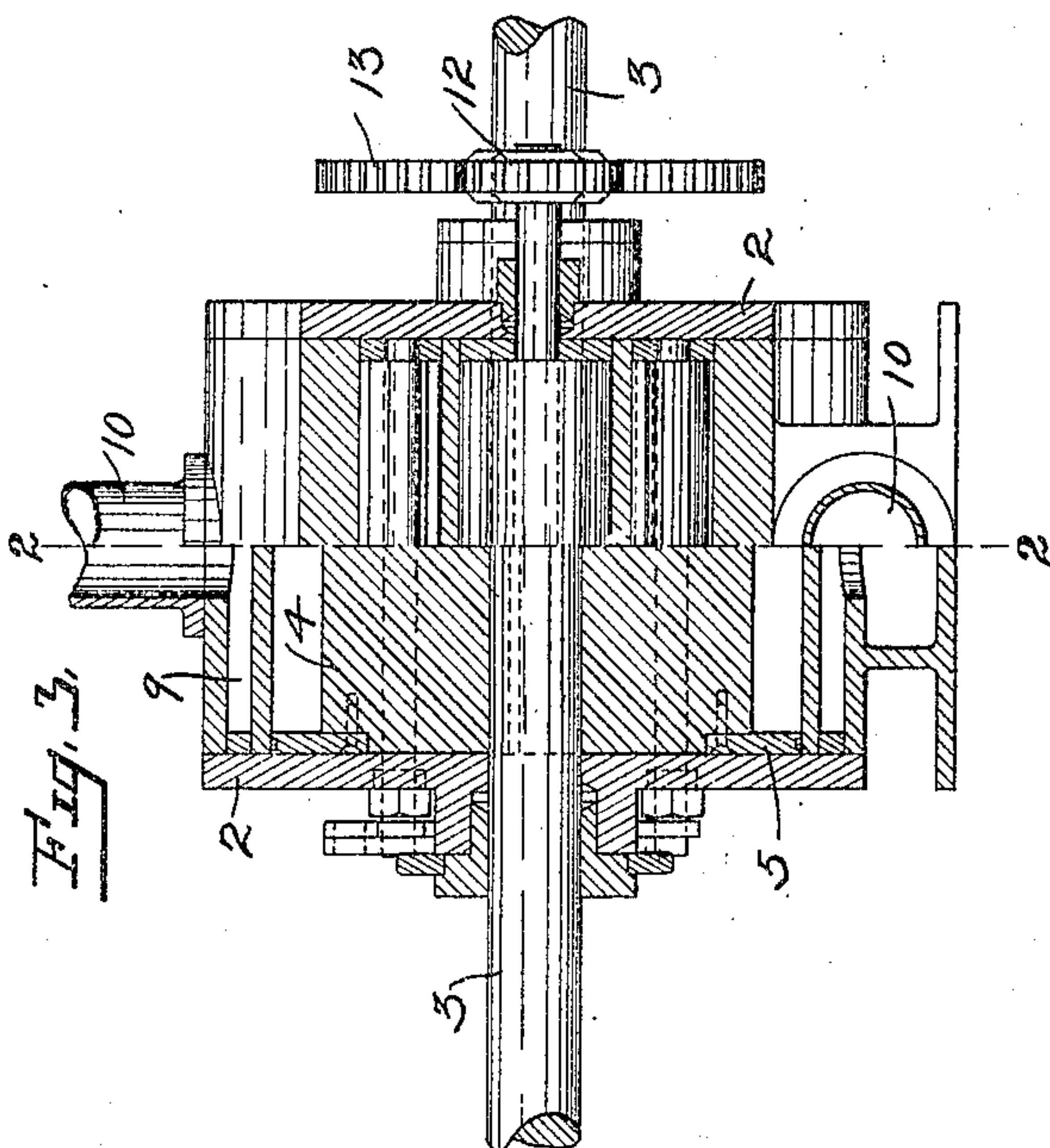
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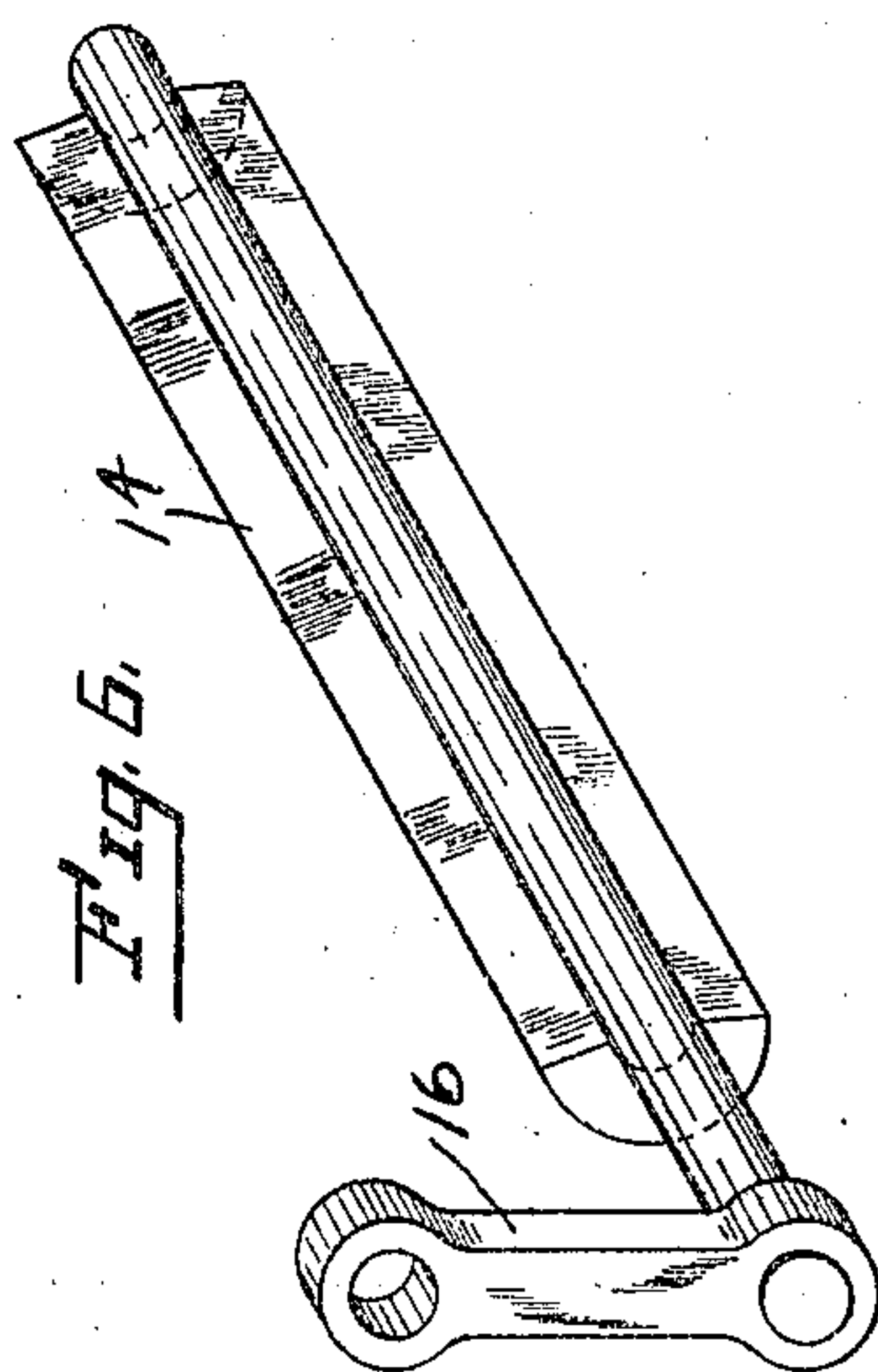
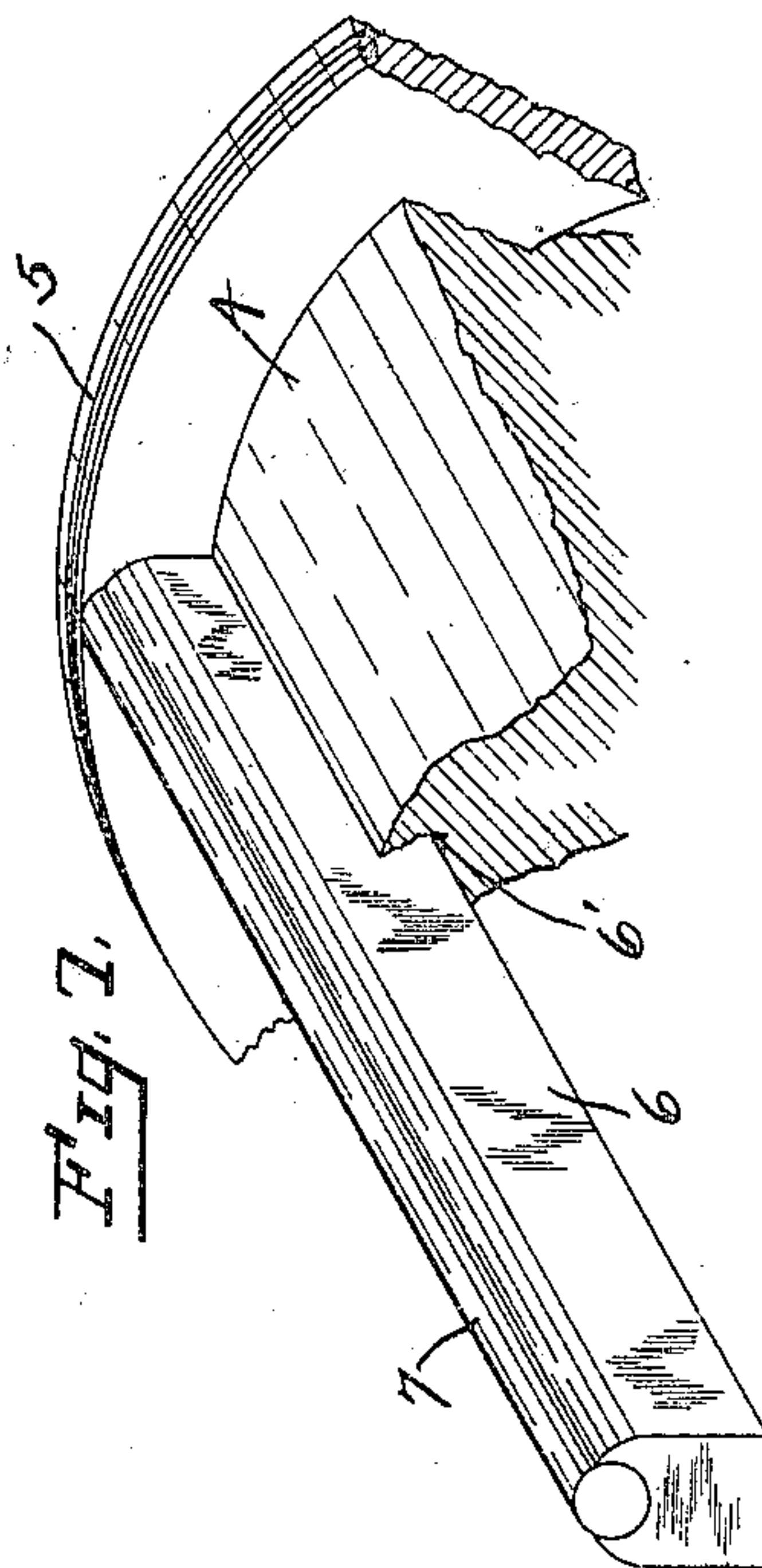
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ANSON S. LEVAKE, OF SEATTLE, WASHINGTON, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO ROBERT P. THOMAS, OF ANACORTES, WASHINGTON, SEVENTEEN ONE-HUNDREDTHS TO HERMAN F. RICHTER, AND SEVENTEEN ONE-HUNDREDTHS TO CHARLES W. RICHIE, OF SEATTLE, WASHINGTON.

ROTARY ENGINE.

No. 822,378.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed July 31, 1905. Serial No. 272,112.

To all whom it may concern:

Be it known that I, ANSON S. LEVAKE, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to certain new and useful improvements in rotary engines; and the primary object thereof is to produce a comparatively simple and inexpensive construction, which can be operated in a powerful manner by a minimum supply of steam and will be economical of motive fluid.

A further object is to provide a piston of novel construction which will in a great measure prevent the passage of steam between the sides of the piston and the adjacent heads of the engine-casing.

A further object is to provide expansible abutments which are adapted to have snug fit in their seats, thereby preventing any escapement of steam around the same.

With the above and other objects in view, to be referred to in the following specification and succinctly pointed out in the appended claims, in the accompanying drawings, Figure 1 is a view in perspective of my improved engine. Fig. 2 is a view, partly in end elevation, the casing-head being removed, and partly in section, taken on lines 2 2 of Fig. 3. Fig. 3 is a sectional view taken on lines 3 3 and 4 4 of Fig. 2. Fig. 4 is a detail view, in side elevation, of one of the abutments. Fig. 5 is a cross-sectional view thereof. Fig. 6 is a detail view in perspective of one of the valves, and Fig. 7 is an enlarged fragmentary view in perspective showing more clearly the manner of mounting the antifriction-rollers.

In carrying out my invention, I provide a casing 1, having the removable heads 2, and rotatably mounted therein on a suitable shaft, as 3, is a piston 4. This piston is cut out on its opposite ends adjacent its edges to provide seats for rings 5, which are removably secured therein by screws or the like, as shown. These rings project beyond the periphery of the piston, (see Fig. 3,) thereby providing edge flanges, and their free edges are preferably provided with packing-rings,

as shown, which have snug engagement with the interior of casing 1.

Reference-numeral 6 indicates the wings, the same being removably fitted in seats 6' in the periphery of the piston, and these wings have their ends abutting rings 5, so that longitudinal movement of said wings is prevented. These wings have their outer portions grooved for reception of antifriction-rollers 7, which normally engage the interior of the casing and have their ends abutting the rings 5, (see Fig. 7,) whereby lengthwise movement of said rollers is prevented. There are preferably three of these wings, and therefore they, together with wings 5, divide the periphery of the piston into three compartments.

Casing 1 is provided with opposite pairs of inlet-ports 8, from which channels 9 lead to exhaust-ports 10, and between these pairs of inlet-ports I mount the rotary abutments 11 and 11'. These abutments are provided with gears 12 in mesh with a larger gear 13, fixed to shaft 3, and are thus rotated.

Valves, as 14, (see Fig. 6,) are mounted for oscillation in the inlet-ports, and they operate alternately to admit steam into the casing. When one valve of each pair is acting in this manner, the other is arranged to establish communication between the interior of the casing and the adjacent channel 9. Thus by reference to Fig. 2 it will be observed that the piston is traveling in the direction of the arrow, steam being admitted through the inlet-port arranged above abutment 11. Then after the wing acted upon passes the other abutment it is again impelled by steam admitted through the lower inlet-port of the other pair, and the steam received from the first inlet-port is exhausted from the interior of the casing through the upper port of the last-named pair into channel 9, and thence to exhaust-port 10. This operation continues, as is obvious, until it is desired to reverse the direction of travel of the piston. This is effected by moving lever 14^a, mounted for oscillation on shaft 3, in the direction of the arrow, the lever being formed with opposite ears 14', to which links 15 are pivoted, said links having their other ends pivoted to levers 16, secured to the valves.

The abutments are of novel construction, the same being formed with a pocket 17 and cut-out portions on opposite sides thereof, which cut-out portions constitute seats for the ends of a rim 18, which is expansible, so as to always snugly hug the seat of the abutment. These rims are preferably formed of spring metal and have their end portions formed with slots 18', through which headed pins project, said pins merely serving to prevent displacement of the rims. Guide-lugs 19 are also provided on the under faces of said rims to insure a true relation between the rims and bodies of the abutments at all times.

In the foregoing I have described an engine which has been demonstrated to be efficient in operation. I reserve the rights, however, to make such alterations and changes in the details of construction as fall within the scope of the appended claims.

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

1. In a rotary engine, a piston having continuous edge flanges, wings secured to said piston between the flanges thereof, and rollers mounted in the outer portions of said wings and being prevented from lengthwise movement by the flanges of said piston.

2. In a rotary engine, a rotary abutment having an expansible rim, and means for holding said rim in position on the abutment.

3. In a rotary engine, in combination with a casing having opposite pairs of inlet-ports, steam-channels communicating therewith, and exhaust-ports in communication with said channels, abutments arranged between the respective pairs of inlet-ports, valves for alternately opening and closing the respective ports of each of said pairs of inlet-ports, and a rotary piston mounted in said casing and having wings.

4. In a rotary engine, in combination with a casing having opposite pairs of inlet-ports, steam-channels communicating therewith,

and exhaust-ports in communication with said channels, rotary abutments arranged between the respective pairs of inlet-ports, said abutments having peripheral cut-out portions, valves for alternately opening and closing the respective ports of each pair, a rotary piston mounted in said casing, and fixed wings on said piston adapted for reception in the cut-out portions of said abutments.

5. In a rotary engine, in combination with a casing having opposite pairs of inlet-ports, steam-channels communicating therewith, and exhaust-ports in communication with said channels, rotary abutments arranged between the respective pairs of inlet-ports, said abutments having peripheral cut-out portions, valves for alternately opening and closing the respective ports of each pair, levers on the ends of said valves, links connected at one end to said levers, a swingingly-mounted lever having opposite ears to which the other ends of the adjacent links are pivoted, a rotary piston mounted in said casing, and fixed wings on said piston adapted for reception in the cut-out portions of said abutments.

6. In a rotary engine, an abutment comprising a body, an expansible spring-metal rim secured thereto, and guide-lugs secured to said rim and being slidably engaged in said body.

7. In a rotary engine, in combination with a casing having opposite pairs of inlet-ports, steam-channels each communicating with one port of each pair of ports, exhaust-ports in communication with said steam-channels, abutments between the respective pairs of ports, valves for alternately opening and closing the respective ports of each of said pairs of inlet-ports, and a piston mounted for rotation in said casing.

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

ANSON S. LEVAKE.

Witnesses:

JOHN W. FILKINS,
S. B. FOLEY.