No. 852,144. PATENTED APR. 30, 1907.

J. W. STAM.

ROTARY MOTOR.

APPLICATION FILED JAN. 12, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

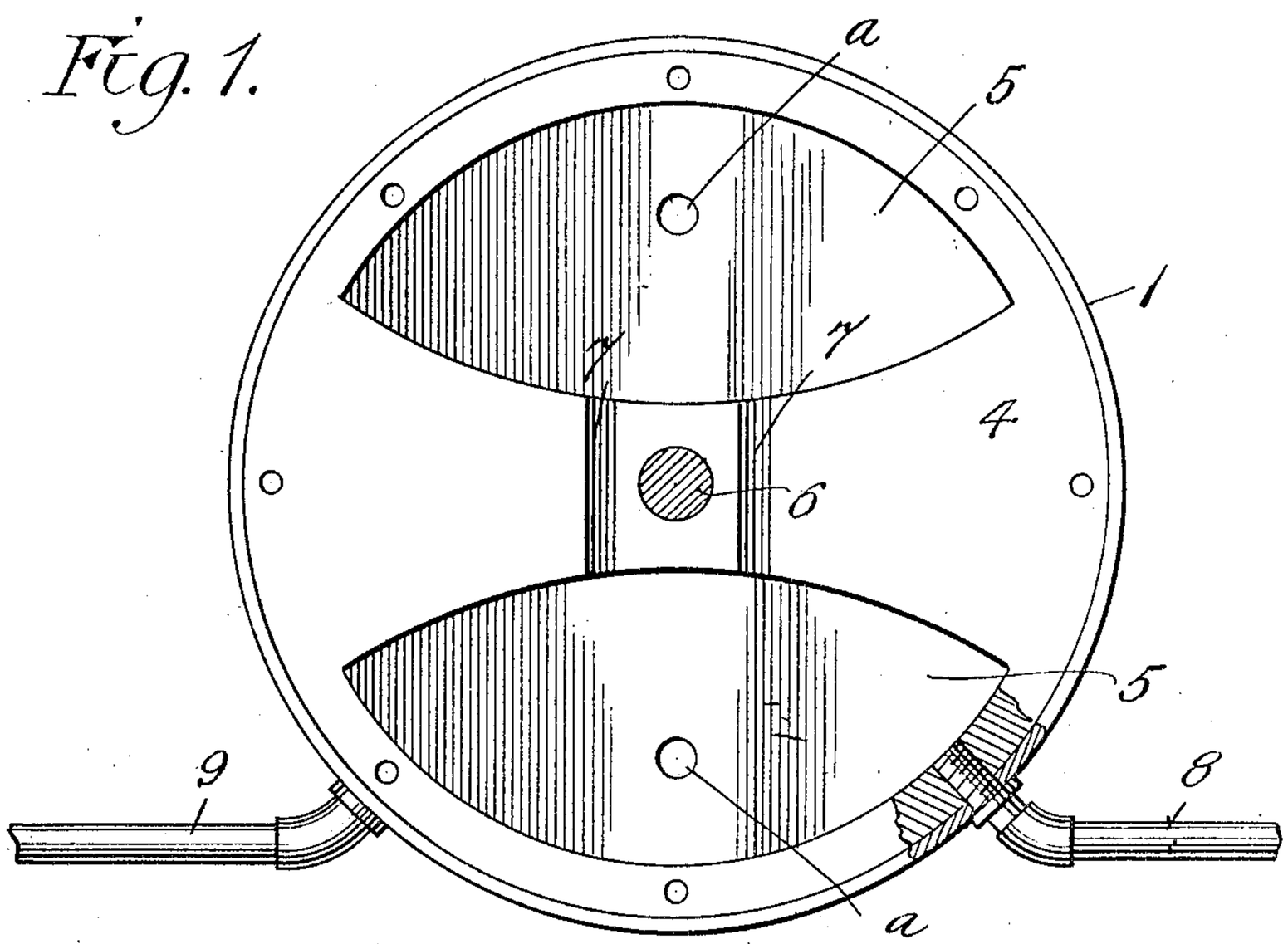
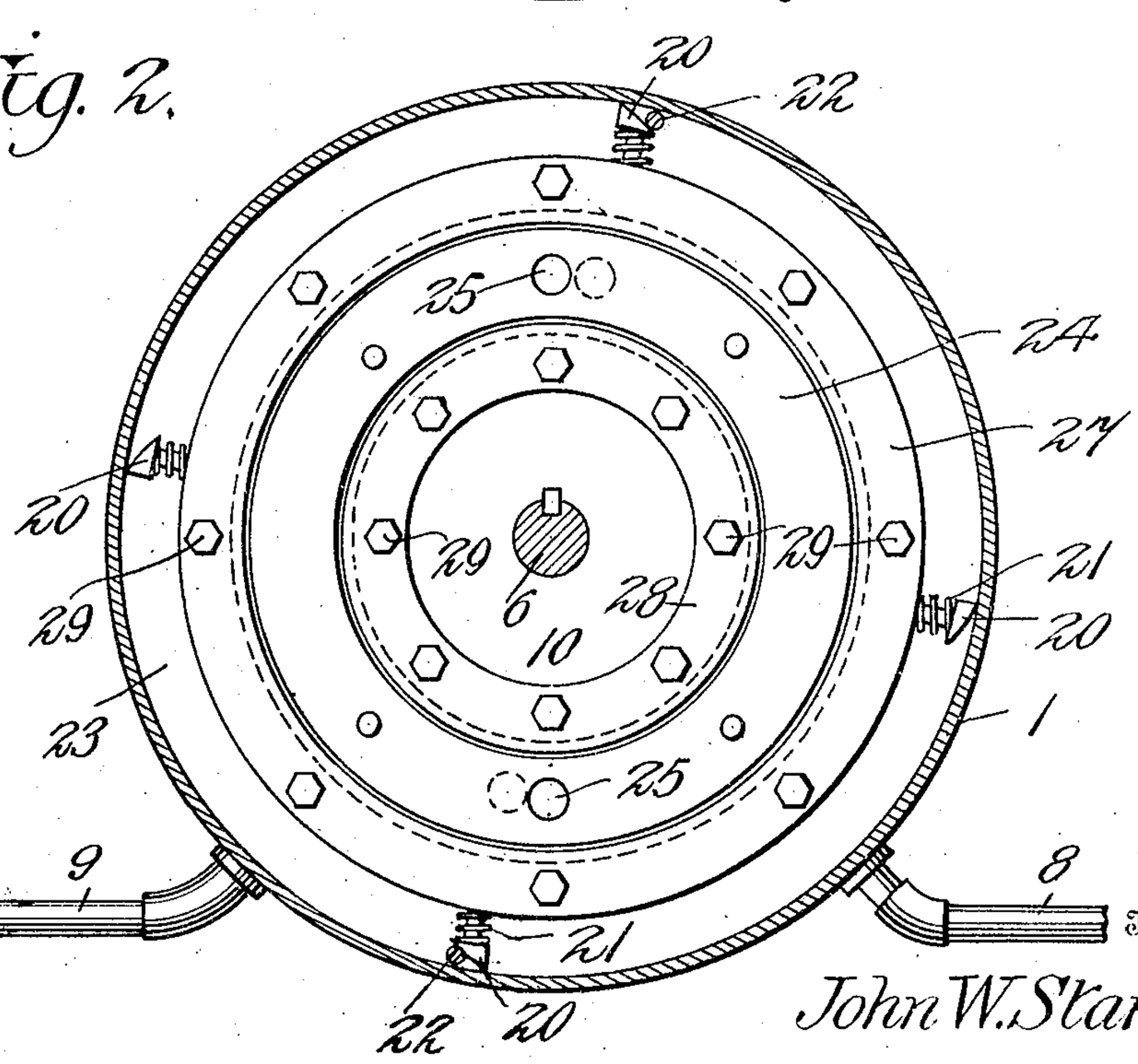


Fig. 2.



Witnesses

F. E. Ackemann Jr.

E. F. Bergen

Inventor

John W. Stam

By Victor J. Evans

Attorney

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3 SHEETS—SHEET 2.

Fig. 3.

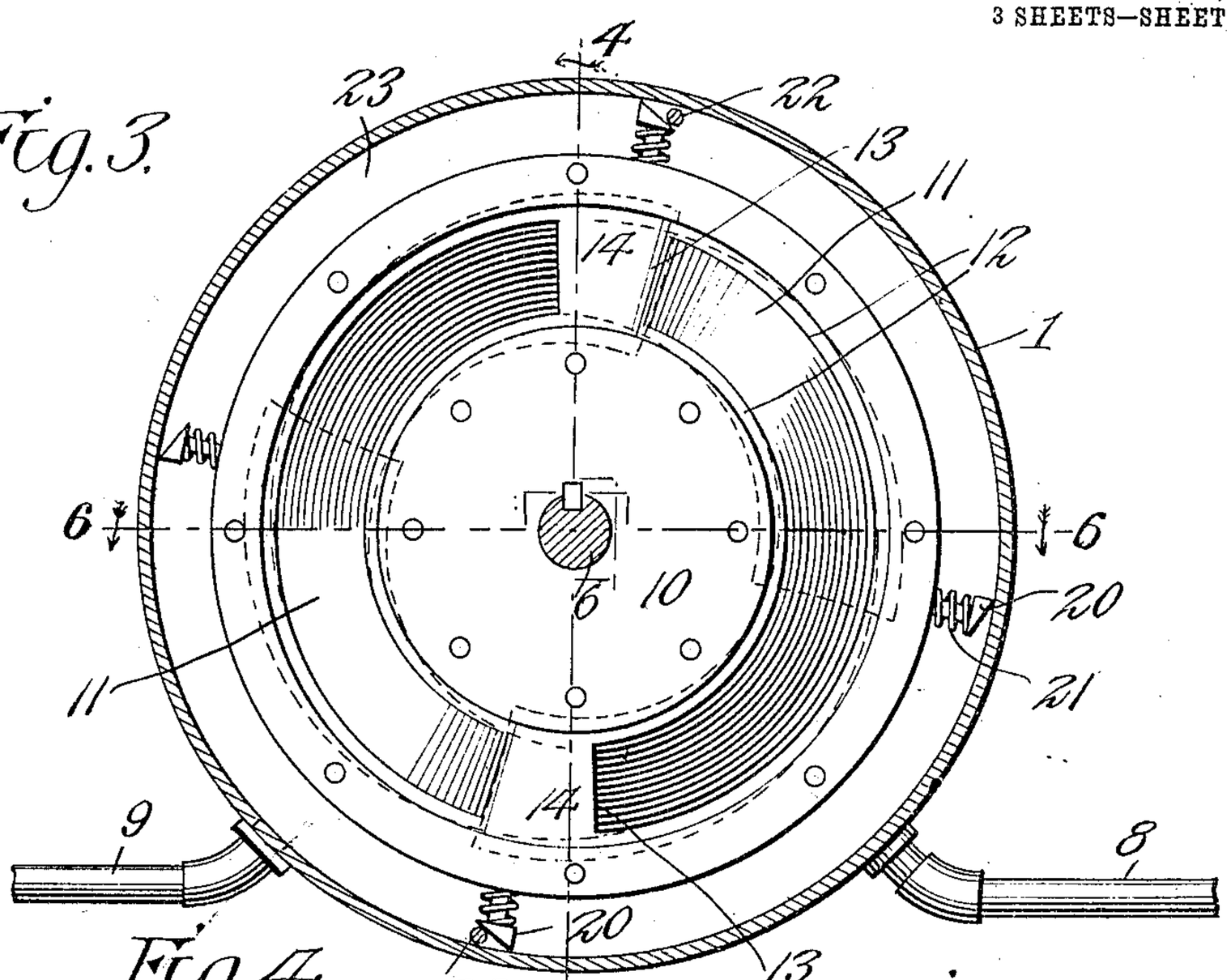
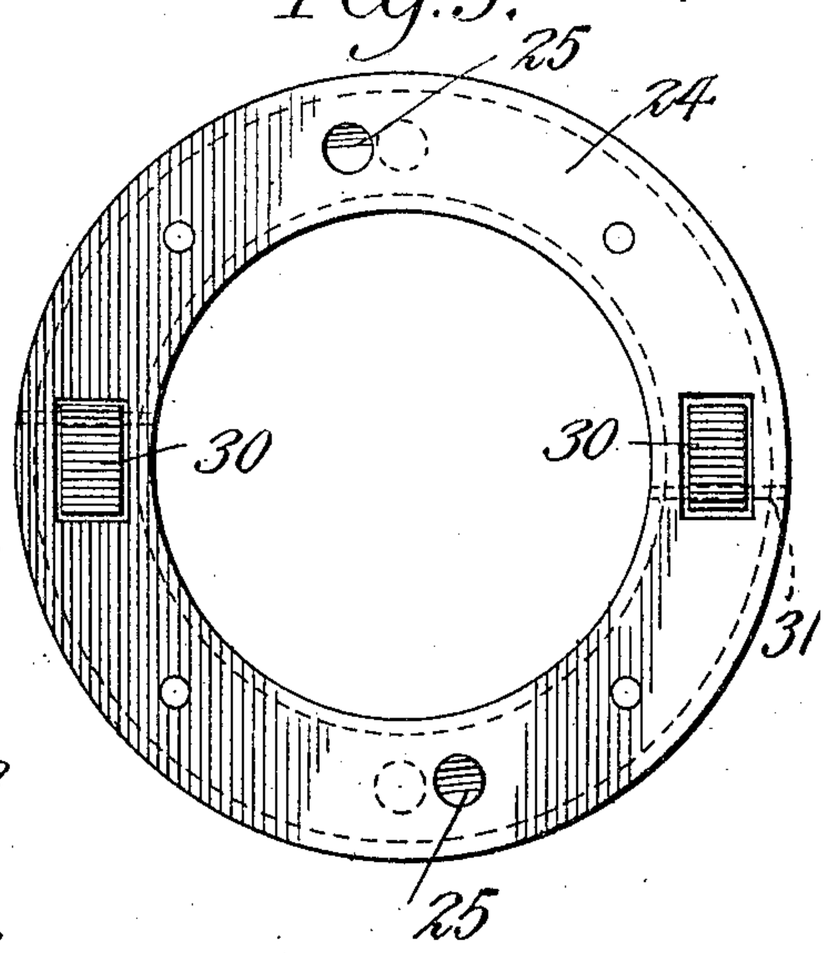


Fig. 4.

Fig. 5.



Witnesses

F. C. Ackemann

E. P. Bunyea

Inventor

John W. Stam

By Victor J. Evans

Attorney.

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3 SHEETS—SHEET 3.

Fig. 6.

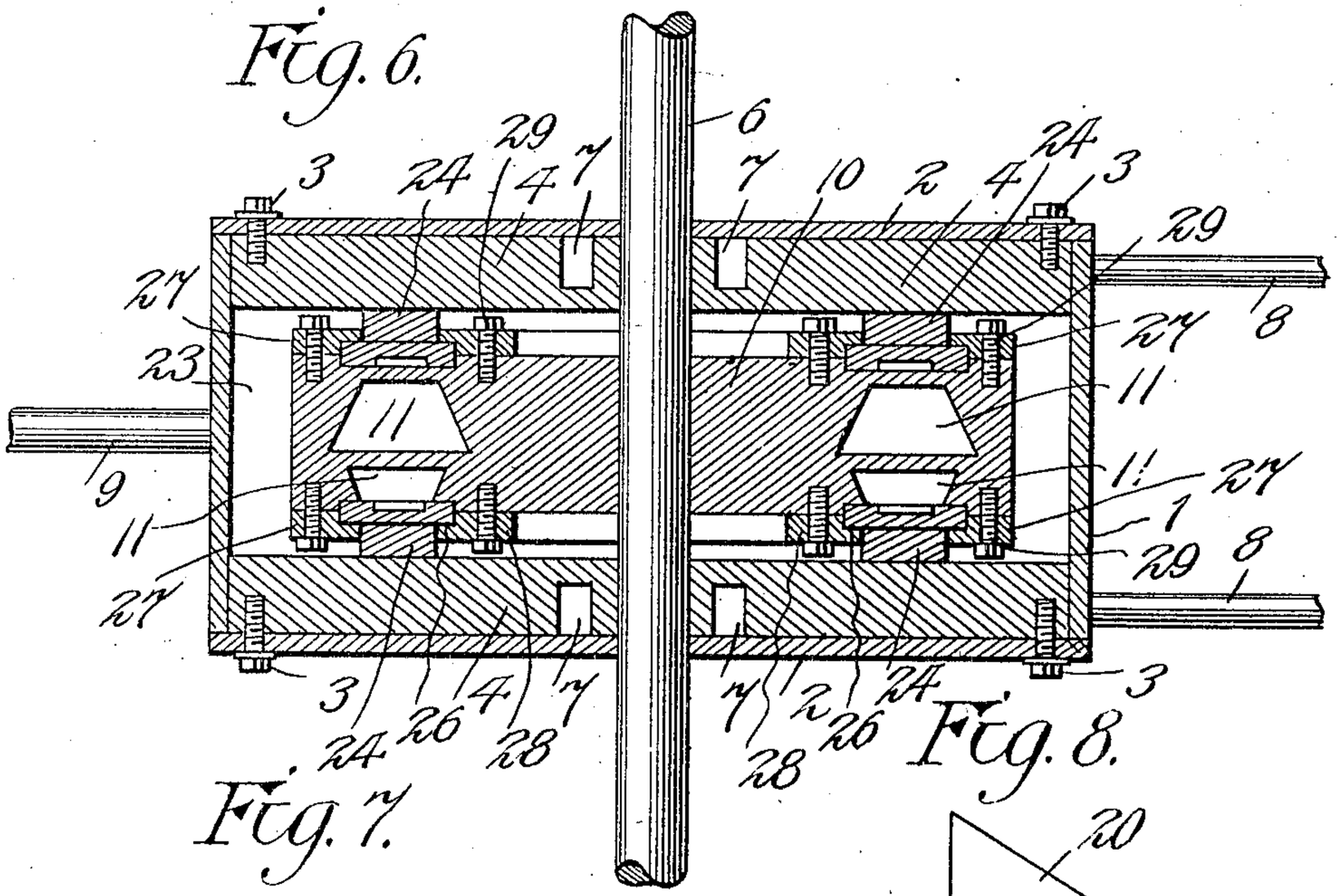


Fig. 7.

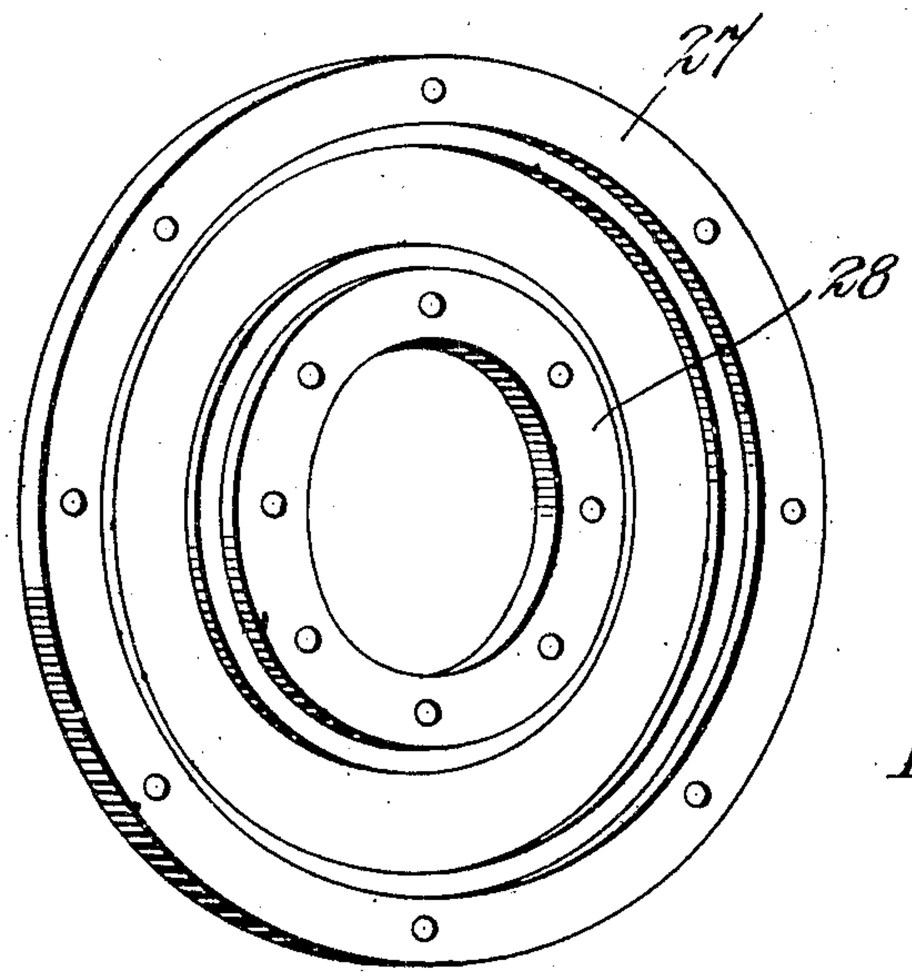


Fig. 8.

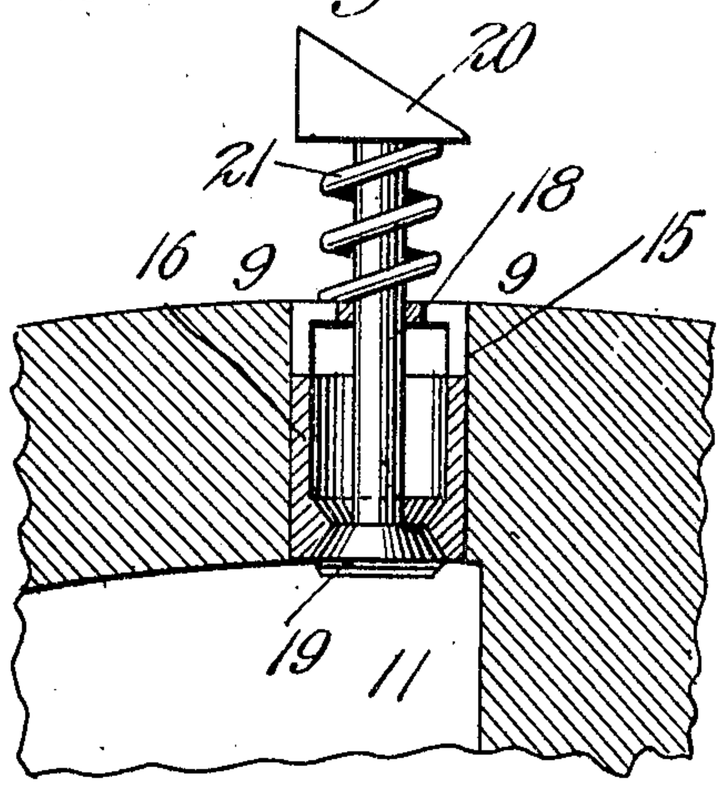
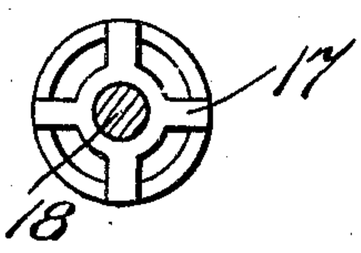


Fig. 9.



Witnesses

E. A. Ackermann

E. P. Bruce

Inventor

John W. Stam,

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

JOHN W. STAM, OF CHINOOK, MONTANA.

ROTARY MOTOR.

No. 852,144. Specification of Letters Patent. Patented April 30, 1907.

Application filed January 12, 1907. Serial No. 351,993.

To all whom it may concern:

Be it known that I, JOHN W. STAM, a citizen of the United States of America, residing at Chinook, in the county of Chouteau and State of Montana, have invented new and useful Improvements in Rotary Motors, of which the following is a specification.

This invention relates to rotary motors, and one of the principal objects of the same is to provide an efficient motor of simple construction which will be economical in the use of steam or other motive element, and which will operate smoothly and uniformly.

Another object of my invention is to provide a rotary motor in which the centrally disposed rotative element is provided with pockets upon each of its side faces which are automatically placed in communication with steam chests located at opposite sides of the inner wall of the casing without the use of moving valves.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which:

Figure 1 is a view in elevation showing the steam chests within the casing at opposite sides of the central shaft. Fig. 2 is a similar view showing the arrangement of the steam inlet ring, and the means for holding the same rigidly to the steam chest. Fig. 3 is a vertical section through the casing and showing a face view of one side of the rotary element. Fig. 4 is a central vertical section of the motor, taken on the line 4—4, Fig. 3 looking in the direction indicated by the arrow in said Fig. 3. Fig. 5 is a plan view of the steam inlet ring. Fig. 6 is a longitudinal section on the line 6—6, Fig. 3 looking in the direction indicated by the arrows in said figure. Fig. 7 is a perspective view of the two retainer rings. Fig. 8 is a detail sectional view showing one of the exhaust valves. Fig. 9 is a detail sectional view on the line 9—9, Fig. 8.

Referring to the drawings for a more particular description of my invention, the numeral 1 designates the casing comprising a ring or band disposed between two face plates 2. Secured by means of bolts 3 to each of the face plates 2 is a plate or disk 4 provided with steam chest compartments 5 located at opposite sides of the central shaft 6 which passes through said plate or disk 4. The steam compartments 5 are provided with intercommunicating steam passages 7. An inlet pipe 8 for steam passes through the casing 1 and communicates with one of the steam chambers 5, as shown more particularly in Fig. 1, and an exhaust pipe 9 communicates with the interior of the casing 1 at a point intermediate between the two disks 4. Upon reference to Fig. 6 it will be seen that there are two inlet pipes 8, one for each plate or disk 4.

Fixed upon the shaft 6 is the rotary element 10 provided upon its opposite faces with curved inclined steam pockets 11 provided with dovetailed or undercut side walls 12 and an undercut shoulder or abutment 13 at the terminal end of each pocket. Upon reference to Fig. 3 it will be seen that these curved pockets are reversely disposed on opposite sides of the same face of the element 10 and that the pockets upon opposite sides of said element are disposed oppositely to those of the other side. Dividing the pockets at diametrically opposite sides of the element 10 are plain surfaces 14 which serve as cut-offs for the steam at those points. At four points within the periphery of the rotary element 10 are formed openings 15, Fig. 8, which extend through the outer portion of the element 10 and communicate with the pocket 11 at points adjacent to the abutment 13. Mounted in the opening 15 is a valve seat 16 provided with a skeleton portion 17 through which the valve stem 18 passes, said valve stem having a conical valve 19 on one end, and an inclined cam 20 upon the opposite end, a coil spring 21 being disposed between the cam 20 and the case 17, and the tension of said spring being exerted to seat the valve.

At suitable points within the casing 1 is located a pin 22 against which the cams 20 are brought in contact during the rotation of the element 10 to unseat the valve and permit the steam to exhaust into the chamber 23 outside the rotary element and escape through the exhaust pipe 9. A steam inlet ring 24, Fig. 5, is provided with diagonally disposed inlet openings 25, said openings extending through the ring 24 in an inclined or diagonal direction and communicating at their inner portions with the steam pockets 11 while the outer end of said openings com-

municate with the steam chests 5. The ring 24 is provided with outwardly extending flanges 26 which are guided during the rotation of the element 10 by means of a retainer ring 27 and a smaller retainer ring 28, said rings being secured by bolts 29 to the rotary element 10 and forming a guideway between them for the flanges 26 of the inlet ring 24. Oscillating tongues 30 are pivoted at 31 upon the inner face of ring 24, adapting themselves to curve, and rise and fall of pockets 11, thereby obviating reverse flow of steam or other motive element, and in consequence striking abutments 13 with greater impact.

The operation of my invention may be briefly described as follows: Steam being admitted through pipe 8 to the steam chambers 5 which are placed into communication by means of the openings 7 in the disk 4, the steam or other motive element passes through the openings *a* in the plates 4 and from thence through the diagonally disposed inlet openings 25 in the ring 24, the steam by impact impinging upon the abutments 13 and rotating the element 10. The opening 25 is closed by means of the plain surfaces 14 disposed intermediate the pockets 11, and at this point the cam 20 comes in contact with the pin 22 which unseats the valve 19 and permits the steam to exhaust into the chamber 23. The steam chests 5 normally contain sufficient steam or other motive element to operate upon both pockets on one side of the element 10 simultaneously, and while the pockets upon one side of the element 10 are receiving steam, those upon the other side are being exhausted and vice versa. Hence, the rotary element is receiving two jets of steam almost continuously upon one side or the other of said rotary element.

From the foregoing it will be obvious that a rotary motor made in accordance with my invention is of simple construction, can be readily used as a compressed air, steam, gas or other motor and that, owing to the fact that the rotary element receives steam upon opposite sides thereof, the action is smooth, balanced and uniform. That this motor may be easily converted to the use of other elements than steam by eliminating openings 7 and 8 from steam chests 5, Fig. 1, and placing automatic valve at opening *a*, thereby forming compression chambers 5. Outside face of casing on each side to have two alternating compressors or cylinders, pistons of same to attach to shaft 6 by means of cams or cranks, automatically compressing gasolene or other element and discharging same into chamber 5 for explosion or discharge through *a* to 11.

Having thus described the invention, what I claim is:

1. In a rotary motor, a casing, steam chests disposed at opposite sides of said casing, an inlet ring secured to said steam chests and provided with an opening communicating therewith, and a rotary element having oppositely inclined steam pockets upon opposite faces thereof, abutments at the terminal ends of said pockets, exhaust valves communicating with said pockets, cams on said valves, and means for opening said valves at intervals to exhaust, substantially as described.

2. In a rotary motor, oppositely disposed steam chests, a rotary element having inclined pockets in opposite sides thereof, plain surfaces intermediate said pocket, said surfaces operating as valves to cut off the inlet steam, rings disposed between the rotary element and the steam chests and provided with diagonal openings which communicate with said steam chests and with said pockets, substantially as described.

3. In a rotary engine, a casing, oppositely disposed steam chests within said casing, a rotary element provided with oppositely inclined curved pockets provided with inclined end abutments, inlet rings disposed between the rotary element and the steam chests, and automatically operated exhaust valves.

4. In a rotary engine, a casing, oppositely disposed steam chests therein, a rotary element mounted upon a shaft and disposed intermediate said steam chests, oppositely inclined dovetailed pockets in said rotary element, inclined abutments at the ends of said pockets, means for admitting steam to said pockets intermittently, and means for exhausting the steam from said pockets intermittently and automatically.

5. In a rotary motor, a rotary element provided with curved oppositely inclined dovetailed pockets, inclined abutments at the terminal ends of said pockets, and plain cut-off portions between said pockets, substantially as described.

6. In a rotary motor, a casing, oppositely disposed steam chests within said casing, said steam chests comprising a plurality of chambers with intercommunicating passages, a rotary element disposed between said steam chests, and inclined dovetailed pockets in said rotary element.

7. In a rotary motor, a casing, steam chests therein, a rotary element in said casing, said rotary element having curved dovetailed pockets therein, rings interposed between said rotary element and said steam chests, said rings having diagonally disposed inlets which communicate with the steam chests and with said pockets.

8. A rotary motor comprising a casing, steam chests in said casing, a rotary element mounted between said steam chests and provided with inclined curved pockets, an inlet

ring interposed between said rotary element and said steam chests, said ring having inclined openings which establish communication between the steam chests and the pockets, and said inlet ring being mounted in a guideway formed by two retainer rings secured to the rotary element.

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

JOHN W. STAM.

Witnesses:
HERMANN J. LOHFELDER,
A. W. ZIEBARTH.