930,403.

J. W. MOONEY.

ROTARY MOTOR.

APPLICATION FILED NOV. 11, 1908.

Patented Aug. 10, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

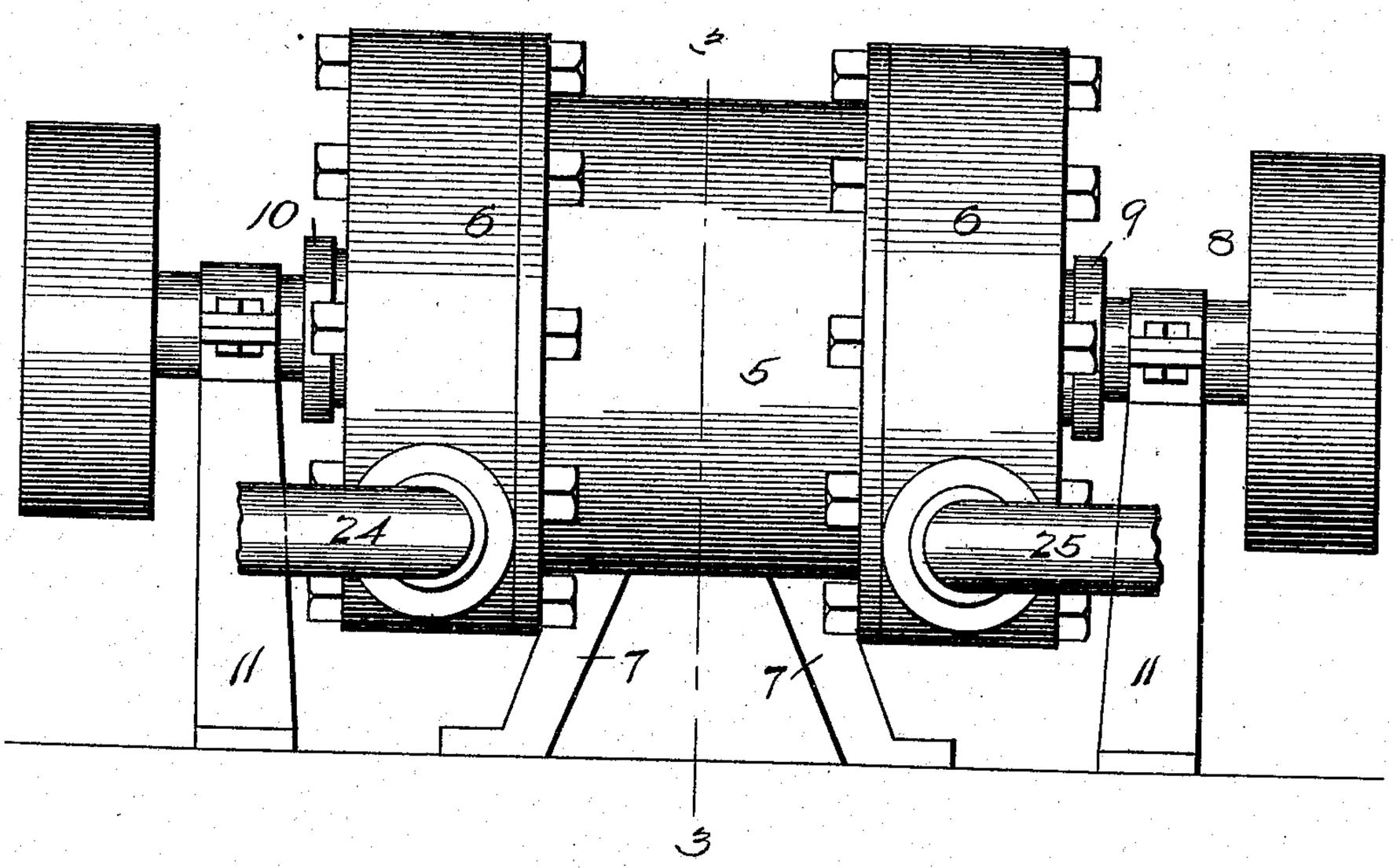
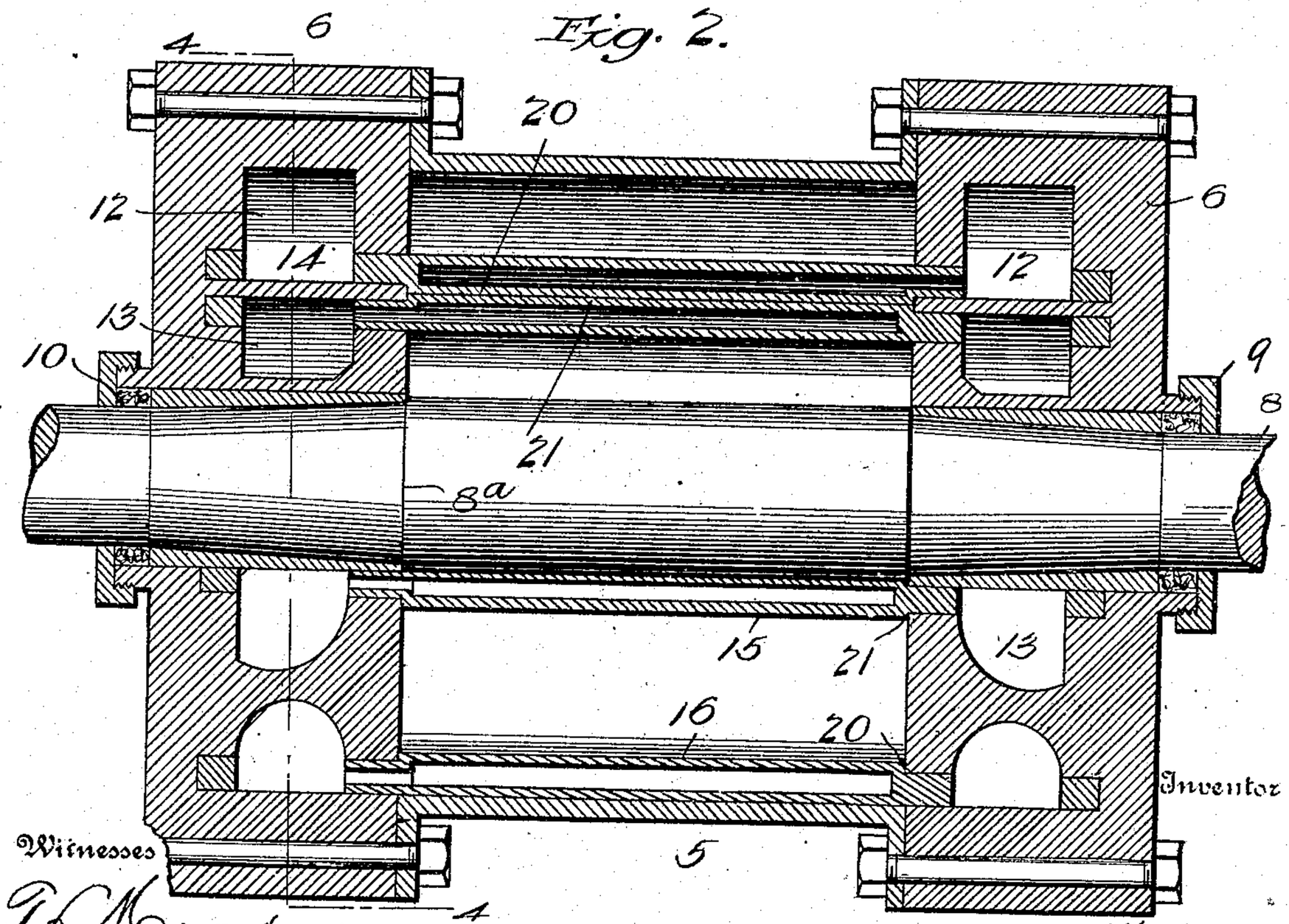


Fig. 2.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 3.

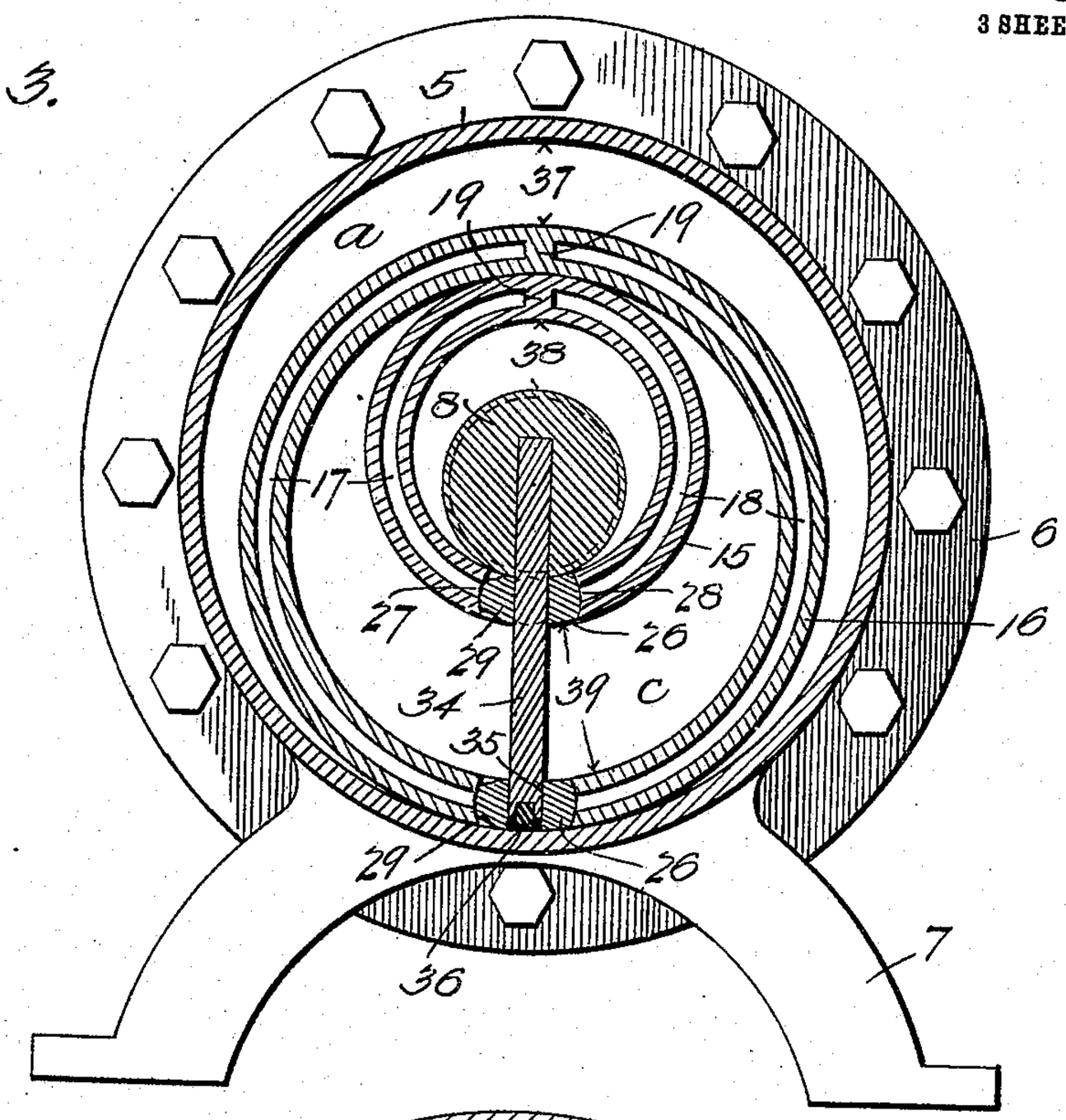
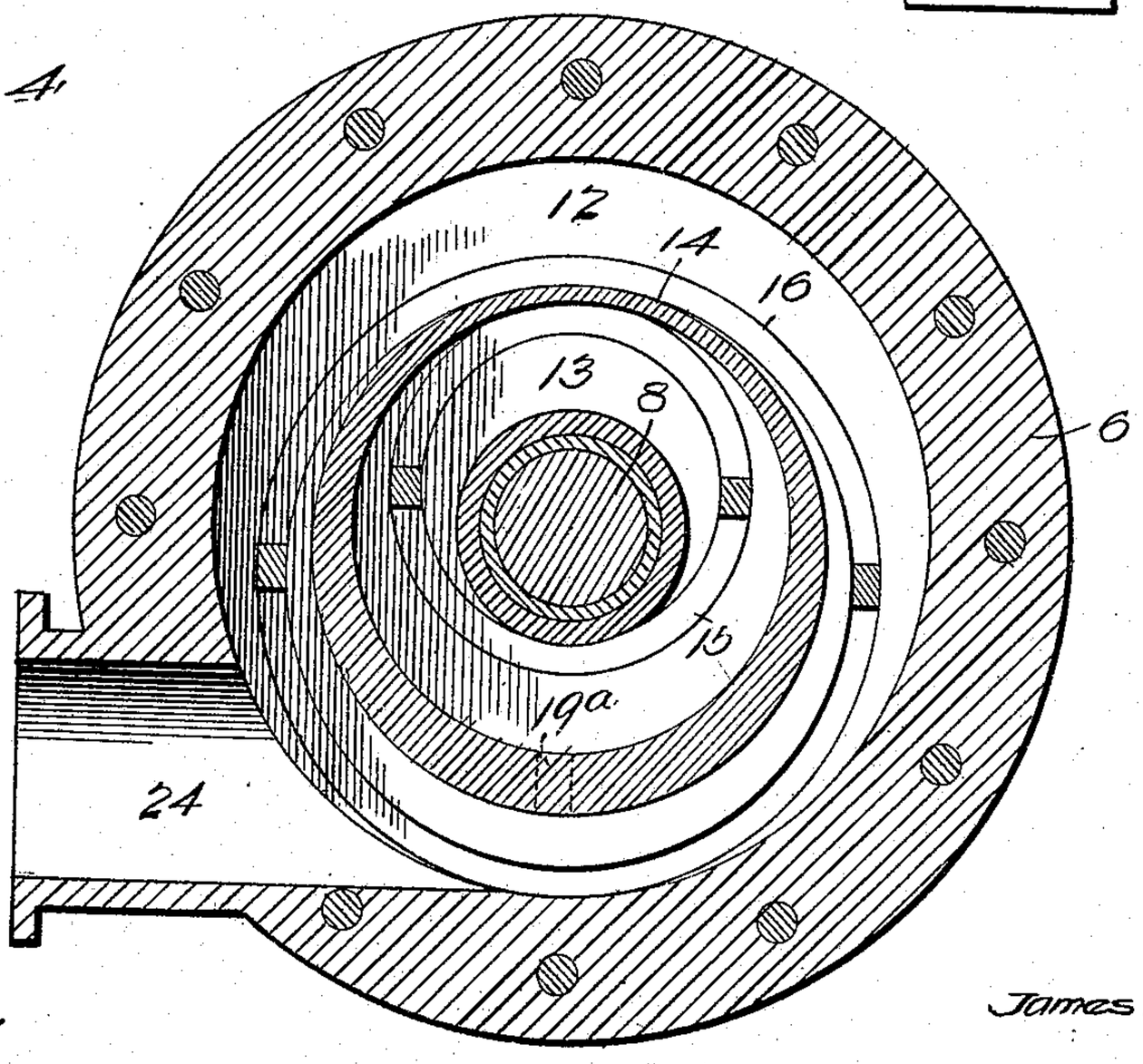


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

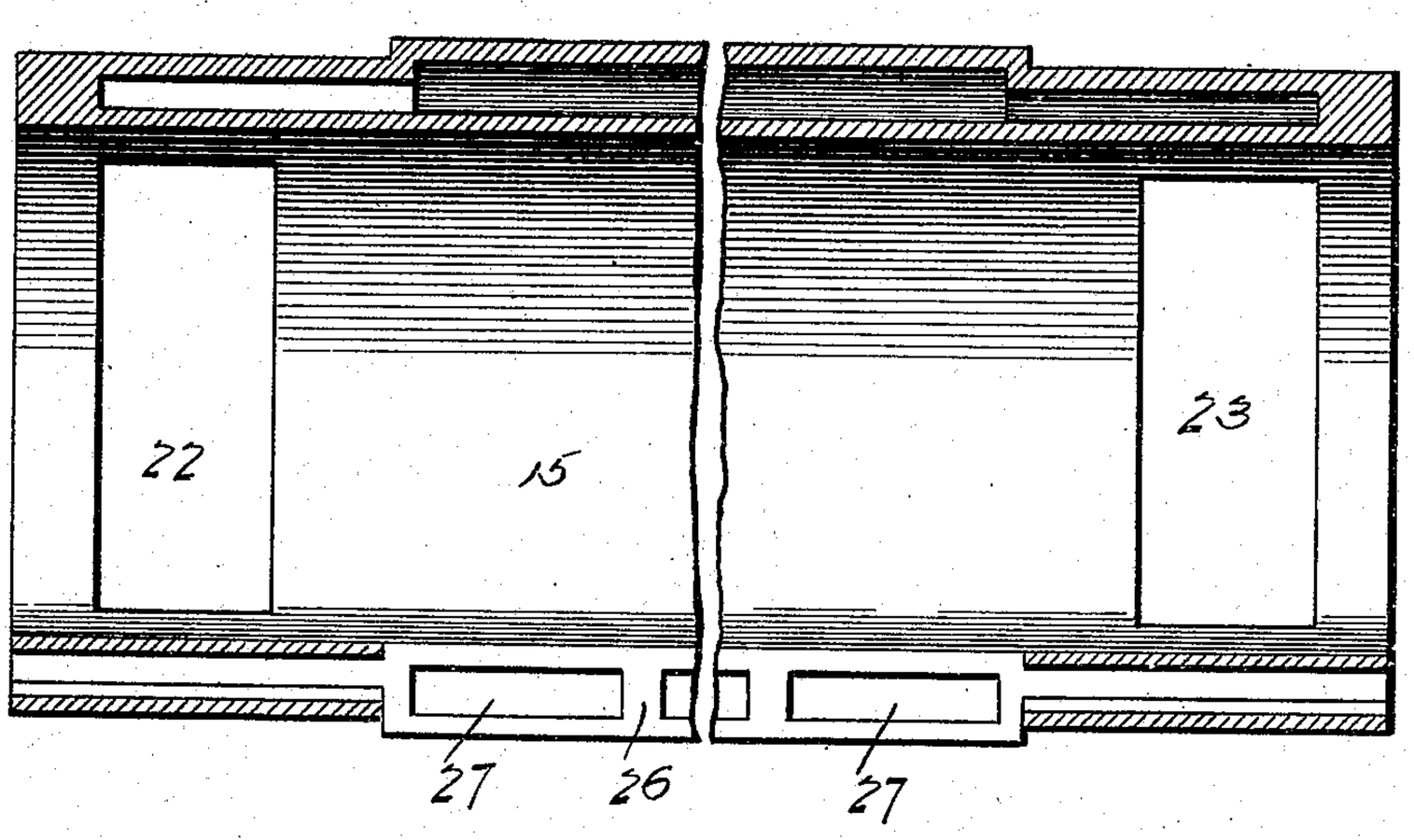


Fig. 6.

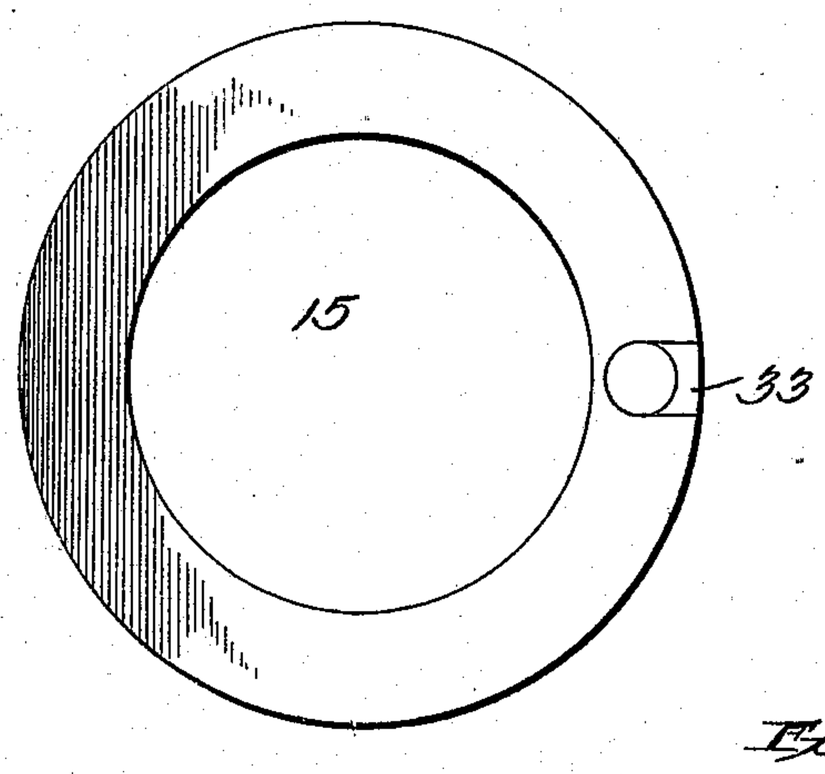
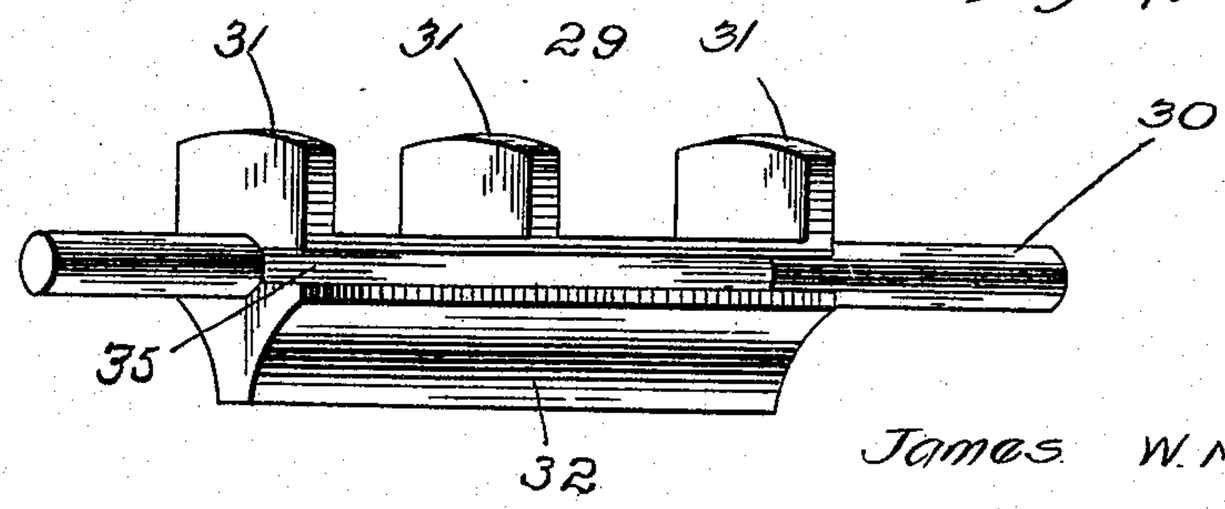


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES W. MOONEY, OF LAWTON, OKLAHOMA.

ROTARY MOTOR.

No. 930,403. Specification of Letters Patent. Patented Aug. 10, 1909.

Application filed November 11, 1908. Serial No. 462,137.

To all whom it may concern:

Be it known that I, JAMES W. MOONEY, a citizen of the United States, residing at Lawton, in the county of Comanche and State of Oklahoma, have invented certain new and useful Improvements in Rotary Motors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a rotary motor or engine particularly devised to fully and economically utilize the driving energy of a motive agent which may be either a fluid or liquid of suitable nature applied to the driving elements to the best advantage to continuously and effectively rotate a power shaft actuated by the driving elements as a unit without lost motion.

The principle involved in this motor is the direct action of the motive agent on a pair of synchronously operating cylinders which are eccentrically disposed within a stationary casing, and which furthermore, are equipped with a common piston and appurtenant valve mechanism arranged in such a manner as to alternately form abutments or pockets of reversely varying steam capacity, the formation of said chests or pockets being in consonance with the relative positions of the two coöperating revolving cylinders, considered as an entirety, and the stationary cylinder or casing. The pockets in their cycle rapidly move and receive the motive agent simultaneously without the least fluctuation and with obvious advantages in overcoming the obstructive influence of "dead center", and in materially reducing wear of the moving parts as well as insuring an effective and positive application of the motive agent.

Specifically the invention contemplates the association of coöperating mechanical devices contributing to the practical operation of the motor and which will be more fully hereinafter specified in preferred form, but subject to such modifications as fairly fall within the scope of the claims.

In said drawings:—Figure I is a side elevation of a rotary motor embodying features of the invention. Fig. II is a longitudinal vertical section of the motor. Fig. III is a transverse vertical section taken along lines 3—3 of Fig. I. Fig. IV is a transverse vertical section taken along lines 4—4 of Fig. II. Fig. V is a longitudinal section of the inner revolving cylinder. Fig. VI is an end elevation of one of the revolving cylinders, and Fig. VII is a detail perspective view of the valve.

The numeral 5 designates a tubular cylinder having opposed heads (6), and fixedly secured to any suitable base by the supports (7). Within the inclosure (5) and extending longitudinally and concentrically therethrough and the heads (6) is a power shaft (8), having a shoulder (8ª) which contacts with the inner sides of said heads and being provided with stuffing boxes (9) and (10), secured to the heads, to obstruct leakage. Exteriorly of the heads (6) the shaft (8) is supported by suitable pillars or uprights (11). At all points lubricating devices for the purpose will be provided. Each of the heads (6) is provided with annular compartments (12) and (13) separated by the transversely extending circular partition (14).

Freely movable within the inclosure (5) and the head (6) are a pair of eccentrically arranged revolving cylinders (15) and (16), the cylinder (15) being the smaller and inclosed within the cylinder (16). As clearly exhibited in Figs. II, III and V, the cylinders are equipped with steam inlet and exhaust chests (17) and (18), the said compartments extending circumferentially with respect to the cylinders and being separated by the partitions (19) so as each of the said chests will occupy a diameter of the cylinders. Communication is established between the outer and inner cylinders by the passages (19ª) in the partition (14). To insure a perfect and reliable bearing for the cylinders and counteract endwise pressure I provide intermediate the ends thereof the outwardly and inwardly circumferentially projecting shoulders (20) and (21), the said shoulders being designed to lie contiguous relative to each other, as clearly shown in Fig. II of the drawings, at a point above the shaft (8) to preclude any possibility of the passage of motive fluid to opposite sides of the spaces which are formed in the manner to be presently set forth. Furthermore, it will be noted that adjacent each terminal of the cylinders I utilize a pair of diametrically disposed, arcuate shaped slots (22) and

(23), the said slot (22) being at all times in registration and communication with the steam inlet chambers (12) and (13), and the slots (23) being similarly disposed with respect to the analogous exhaust chambers (12) and (13), formed in the opposite head (6). Obviously, I provide the steam feed pipe (24) and the steam exhaust pipe (25), which are suitably secured to the head (6). Extending longitudinally of each cylinder, and having lengths equal to the length of the shoulders (20) and (21) is a slot (26) having on opposite sides thereof a plurality of steam ingress ports (27), and a like number of exhaust ports (28), the influx and efflux of the steam through said openings being controlled by the oscillatory valve (29), which comprises a shaft (30) having a plurality of suitably spaced projections (31) and an oppositely disposed integrally formed solid body portion (32), the ends of the shaft (30) being rotatably mounted within the removable bearing plates (33). Keyed to the shaft (8) relatively concentrically therewith is a piston (34) which projects through the slot (35) of the valve (29) and at all times lies contiguous the inner circumference of the stationary cylinder (5). To that end I deem it expedient to provide a suitable packing, such at 36, to minimize friction of these parts. In order to thoroughly equalize the leverage of the steam pressure and consequently obtain advantageous results it is very important that the distances between the outer cylinder (16) and the stationary cylinder (5), as indicated by the arrow (37), and between the shaft (8) and the inner side of the smaller cylinder (15), as shown by arrow (38), and the sum of the spaces, designated by arrows 37 and 38 be equal to the distance (designated by arrow 39) between the cylinders (15) and (16).

In practical operation the steam is admitted through the inlet (24) and thence into the annular chambers (12) and (13) to which said inlet is connected, as hereinbefore described, and finally into the steam chests (17) of the revolving cylinder, thus forming steam headings in spaces indicated by "*a*," "*b*" and "*c*." Now assuming that the piston (34) is traveling to the left from the position shown in Fig. III of the accompanying drawings steam will be admitted through the ingress ports (27) to both spaces "*a*" and "*b*." This operation continues until the piston reaches a point diametrically opposite its initial starting position, at which time the ports (27) are closed by the valve (29) and the steam passes into "*a*." The motive fluid which remains in spaces "*b*" and "*c*" expands until the piston (34) traverses the lower central portion of the stationary inclosure (5) when the exhaust ports (28) are opened and the steam is excluded from space "*a*" and again thrown into spaces "*b*" and "*c*." It will thus be observed that the cylinders (15) and (16) work synchronously and that the piston travels tangentially with respect thereto, that is, during its first and second half of its travel, but when said piston is in a vertical position whether it is in contact with the upper inner circumference or the lower inner circumference of the outer stationary cylinder, it is parallel with said stationary cylinder and the revolving cylinders, the said piston, furthermore, being so constructed and arranged as to automatically operate the valves to alternately open and close the exit openings of the steam chests and the exhaust chests.

What I claim, is:

1. In a rotary motor, the combination with a stationary cylinder, of a pair of revolving cylinders mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, means for forming pockets between all of the cylinders, and means for automatically controlling the influx and efflux of the motive agent to and from said pockets.

2. In a rotary motor, the combination with a stationary cylinder, of a pair of synchronously revolving cylinders mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, means for forming pockets between all of the cylinders, and means for automatically controlling the influx and efflux of the motive agent to and from said pockets.

3. In a rotary motor of the class specified, the combination with a stationary cylinder, of a pair of synchronously revolving cylinders having varying diameters, said cylinders being mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, means for forming pockets between all of the cylinders, and means for automatically controlling the influx and efflux of the motive agent to and from said pockets.

4. In a rotary motor of the class specified, the combination with a stationary cylinder, of a pair of synchronously revolving cylinders having varying diameters, the smaller cylinder bein inclosed within the larger cylinder, and each being provided with steam and exhaust chests, means for forming pockets between all of the cylinders, and means for automatically controlling the influx and efflux of the motive agent to and from said pockets.

5. In a rotary motor of the class specified, the combination with a stationary cylinder, of a pair of revolving cylinders mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, a power shaft, a piston keyed to said shaft and coöperating with

said chest to form pockets between all of the cylinders, and controlling the influx and efflux of the motive agent to and from said pockets.

6. In a rotary motor of the class specified, the combination with a stationary cylinder, of a pair of revolving cylinders mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, valve mechanism for said chests, a power shaft, a piston keyed to said shaft and coöperating with said chests to form pockets between all of the cylinders and control said valve mechanism.

7. In a rotary motor of the class specified, the combination with a stationary cylinder, of a pair of revolving cylinders mounted eccentrically with respect to each other and said stationary cylinder and having steam and exhaust chests, valve mechanism for said chests having removable bearings, a power shaft, a piston fixed to said shaft and coöperating with said chests to form pockets between all of the cylinders and control said valve mechanism.

8. In a rotary motor of the class specified, the combination with a stationary cylinder having heads, of a pair of synchronously revolving eccentrically mounted cylinders, said heads having steam and exhaust chambers, said revolving cylinders being provided with steam and exhaust chests for registration with the said chambers, valves for opening and closing the chests, and means for automatically operating said valves.

9. In a rotary motor of the class specified, the combination with a stationary cylinder having heads, of a pair of synchronously revolving eccentrically mounted cylinders, the latter having correlative shoulders designed to lie contiguous each other, said heads having steam and exhaust chambers, said revolving cylinders being equipped with steam and exhaust chests for registration with said chambers, valves for opening and closing the chests, and means for automatically operating said valves.

10. In a rotary motor of the class specified, the combination with a stationary cylinder having heads, of a pair of synchronously revolving eccentrically mounted cylinders having steam and exhaust chests in the walls thereof, said heads having steam and exhaust chambers, said revolving cylinders having ports adapted to continually register with said chambers, a power shaft having a piston, said cylinders having slots with which the steam and exhaust chests communicate, and valve bars operable in said slots and controllable by the piston for opening and closing the steam and exhaust chests.

11. In a rotary motor, the combination with a stationary cylinder, of revoluble cylinders mounted in said stationary cylinder and having steam and exhaust chests, means for forming pockets between all of the cylinders, and means for automatically controlling the influx and efflux of the motive agent to and from said pockets.

12. In a rotary motor, the combination with a stationary cylinder or casing, of revoluble cylinders mounted in said stationary cylinder, means for forming pockets between all of the cylinders, a shaft extending through said cylinders, a piston fixed to said shaft and extending through said revoluble cylinders, and valve devices secured to the piston and positioned partly in the revoluble cylinders and synchronously actuated for automatically controlling the influx and efflux of the motive agent through said pockets.

13. In a rotary motor, the combination with a stationary cylinder having steam and exhaust chambers, of revoluble cylinders mounted in said stationary cylinder, said revoluble cylinders being provided with steam and exhaust chests registering with the chambers of the stationary cylinder, valves for opening and closing said chests, and means movably engaging said valves for automatically operating the same.

14. In a rotary motor, the combination with a casing, of cylinders or casings revolubly mounted in said first-mentioned casing, said revoluble cylinders provided with means for forming pockets or compartments, and a plurality of valve devices rigidly connected together, and said valve device coöperating with said revoluble cylinders for controlling the passage of a motive agent through the pockets thereof.

15. In a motor, the combination with a stationary cylinder or casing, revoluble cylinders or casings mounted in said stationary cylinder and provided with steam and exhaust chests, valve means for said steam chests, a power shaft, a piston fixed to said shaft and coöperating with said chests for forming pockets between all of the cylinders and controlling said valve means.

16. In a rotary motor, the combination with a stationary cylinder or casing, of revoluble cylinders mounted in said stationary cylinder, said revoluble cylinders provided with steam and exhaust passages, and valve devices for controlling the opening and closing of said steam and exhaust passages, and a piston connecting said valve devices and synchronously actuating the same.

17. In a rotary motor, the combination with a stationary casing or cylinder, of revoluble cylinders or casings having steam and exhaust chests, said stationary cylinder provided with steam and exhaust chambers, said revoluble cylinders having ports adapted to continually register with said chambers, a power shaft provided with a piston, said cylinders having slots or openings communicating with the steam and exhaust chests,

and valve bars operable in said slots and controlled by the piston for opening or closing the steam and exhaust chests.

18. In a motor, the combination with a stationary cylinder, of revoluble cylinders mounted in said stationary cylinder, said revoluble cylinders provided with shoulders designed to lie contiguous to each other, said stationary cylinder provided with steam and exhaust chambers, said revoluble cylinders provided with steam and exhaust chests for registering with said cylinders, valves for opening and closing the chests, and means for automatically operating said valves.

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

JAMES W. MOONEY.

Witnesses:

G. A. PIKE,

J. N. MAYFIELD.