June 10, 1924. 1,497,400

D. L. BALL

ROTARY MOTOR

Filed Dec. 13, 1920 3 Sheets-Sheet 1

Fig. 1.

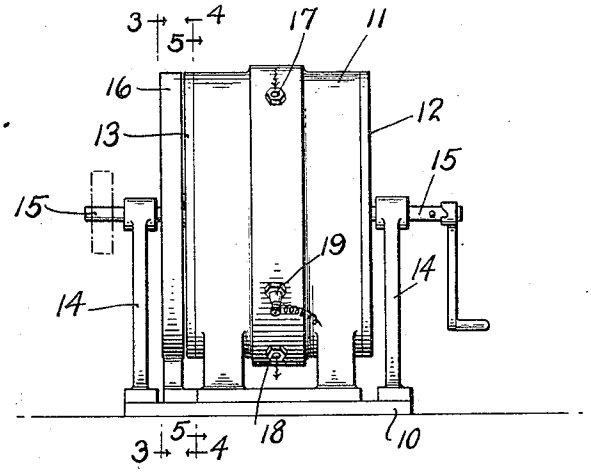
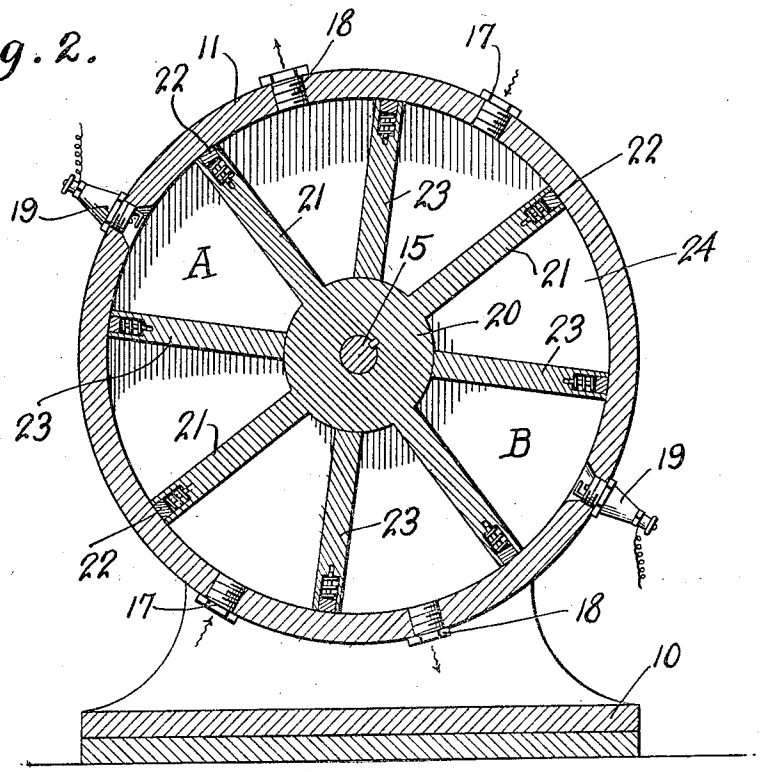


Fig. 2.



L. B. James

WITNESS:

David Lewis Ball. INVENTOR

BY Victor J. Evans

ATTORNEY

June 10, 1924. 1,497,400

D. L. BALL

ROTARY MOTOR

Filed Dec. 13, 1920 3 Sheets-Sheet 2

Fig. 3.

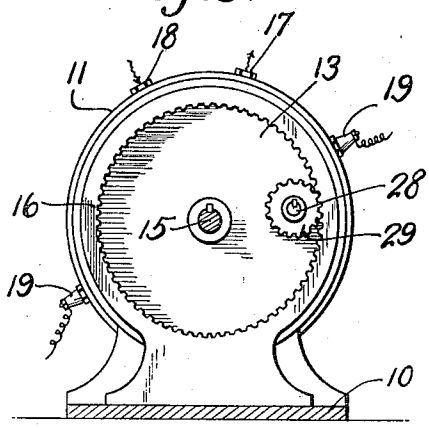


Fig. 5.

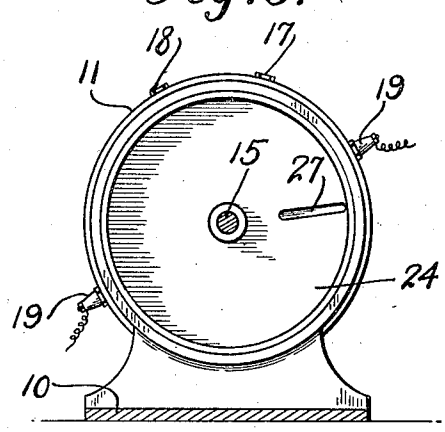


Fig. 6.

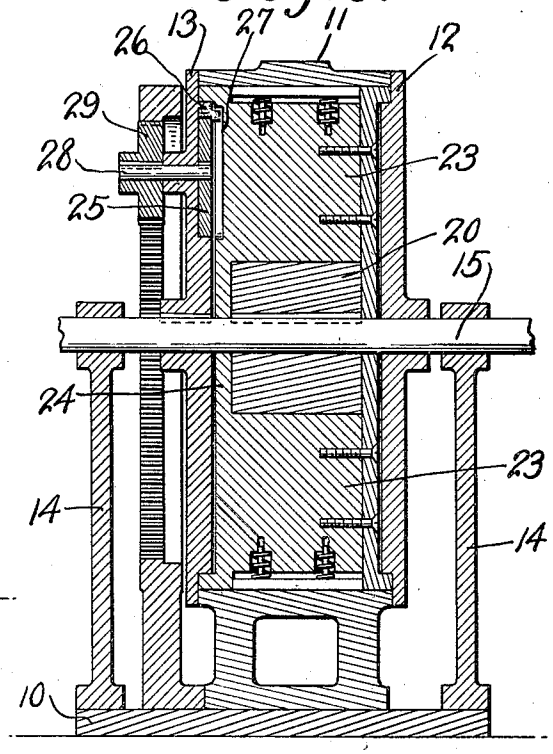
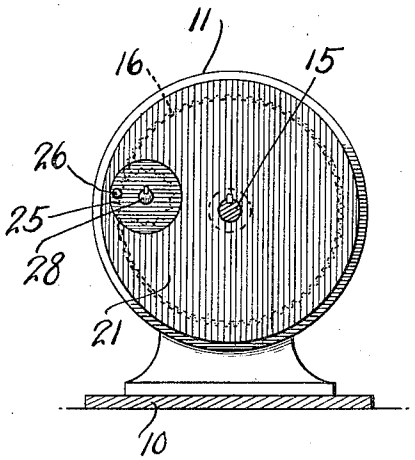


Fig. 4.



L. B. James

WITNESS:

David Lewis Ball. INVENTOR

BY Victor J. Evans

ATTORNEY

June 10, 1924. 1,497,400

D. L. BALL

ROTARY MOTOR

Filed Dec. 13, 1920 3 Sheets-Sheet 3

Fig. 7.

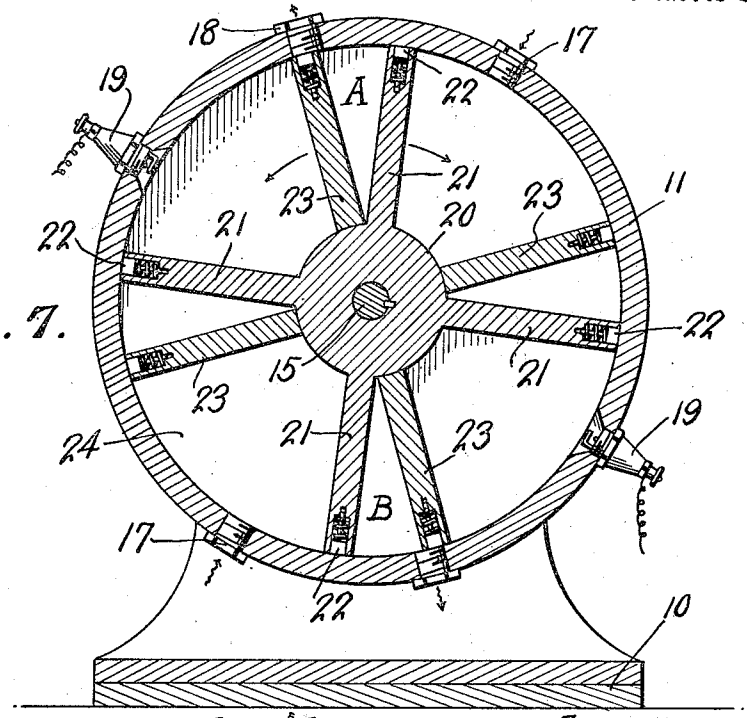
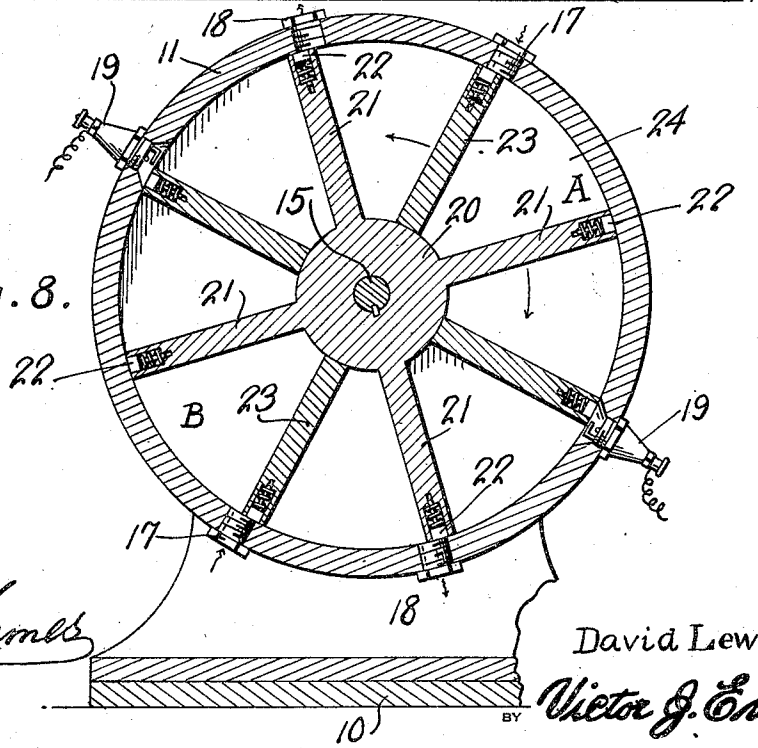


Fig. 8.



WITNESS:

L. B. James

David Lewis Ball.
INVENTOR

BY Victor J. Evans
ATTORNEY

Patented June 10, 1924. 1,497,400

UNITED STATES PATENT OFFICE.

DAVID LEWIS BALL, OF LONG BEACH, CALIFORNIA.

ROTARY MOTOR.

Application filed December 13, 1920. Serial No. 430,426.

To all whom it may concern:

Be it known that I, DAVID LEWIS BALL, a citizen of Great Britain, residing at Long Beach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Rotary Motors, of which the following is a specification.

This invention comprehends the provision of a rotary motor of novel compact construction, susceptable for use as an air compressor pump, steam or gas motor, the invention residing in the construction, combination and arrangement of parts as claimed.

In the drawings forming part of this application like numerals of reference indicate the similar parts in the several views and wherein:—

Figure 1 is a view in elevation of the motor constructed in accordance with my invention.

Figure 2 is a vertical sectional view therethrough.

Figure 3 is a sectional view taken on line 3—3 of Figure 1.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Figure 5 is a sectional view taken on line 5—5 of Figure 1.

Figure 6 is a sectional view taken at right-angles to Figure 2.

Figure 7 is a sectional view showing the relative position of the blades of the rotors on the exhaust stroke.

Figure 8 is a similar view showing the relative position of the parts on the intake stroke.

Referring to the drawings in detail 10 indicates a base upon which is mounted a casing 11. The casing is of cylindrical formation and is crossed at its opposite sides by the plates 12 and 13 respectively. Rising from the base 10 at opposite sides of the casing 11 are parallel standards 14 terminating to provide bearings having a shaft 15 which passes through the casing 11. Mounted upon the base and interposed between the plate 13 and the adjacent standard 14 is the internal gear 16 for a purpose to be hereinafter described. The casing is provided at diametrical points with a pair of inlet and exhaust openings 17 and 18 respectively, while also arranged at diametrical points are openings which accommodate the spark plug 19.

Fixed upon the shaft 15 is a rotor including a hub 20 from which a plurality of blades 21 radiate. Each blade is recessed at its outer end to accommodate a spring pressed packing 22 which is effectively held into contacting engagement with the inner wall of the casing 10. Co-operating with the rotor just described which is fixed upon the shaft 15, is a relatively movable rotor including a plurality of blades 23 projecting from one side of the disk 24, the space between the inner ends of the blades 23 defining a pocket for the reception of the hub 20 of the aforementioned rotor. The blades 23 of the latter mentioned rotor are positioned between the blades 21 of the rotor fixed upon the shaft for oscillatory movement thereby in a manner to be hereinafter described. The blades 23 are moved into close proximity to the blades 21 on the exhaust of the motor and move in a direction away from the blades 21 on the suction or intake stroke.

For oscillating the blades in a manner just described, I preferably provide the plate 13 at one side of the motor casing with a recess to accommodate a disk 25, the latter being equipped with a pin 26 eccentrically disposed and operated within an elongated slot 27 in the disk 24 of the above referred to rotor. Projecting from the disk 25 is a stub shaft 28 upon which is keyed a pinion 29 which meshes with the internal gear 16. Manifestly, when the plate 13 rotates in a direction with the shaft 15 upon which it is fixed, the slot and pin connection between the disk 25 and the disk 24 of the loosely mounted rotor causes the blades 23 of the latter mentioned rotor to oscillate between the blades 21 of the rotor which is directly mounted upon the shaft 15.

In Figure 2 I have shown the relative positions of the blades just prior to the firing of the motor, in which position of the parts all of the blades are substantially spaced equi-distantly. It will be noted that the firing takes place at diametrically opposite points in the chambers A and B, and incident to such firing the rotors are driven to the right. During such movements the blades 23 of the loosely mounted rotor assume positions in close proximity to the blades 21 as shown in Figure 7, wherein the blades 21 have passed beyond the exhaust ports 18. While the blades 21 of the loosely mounted rotor are assuming their position in close proximity to the blades 21 the burnt gases are exhausted through the ports 18, subsequent to the exhaust the blades 23 move

in a direction away from the blades 21 by reason of the slot and pin connection between the blades 23 and the disk 25. However, before the blades 23 start to move away from the blades 21, the rotors have advanced to position the blades as shown in Figure 8, wherein the blades 23 have passed beyond the inlet ports 17 moving in one direction, while the blades 23 of the loosely mounted rotor are being moved away from the blades 21 across the inlet ports 17, thereby sucking or drawing in a charge of fuel. During the continued operation of the motor this fuel is compressed when the blades 23 are again moved in the direction of the blades 21, incident to the slot and pin connection between the blades 23 and the disk 25, which compression takes place just prior to the firing of the motor as will be readily understood.

While it is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What I claim is:—

A motor comprising a base, a casing provided with a pair of inlet and exhaust openings at diametrically opposite sides thereof, parallel standards extending from said base and upon opposite sides of said casing, plates engaging opposite sides of said casing, a shaft journaled in suitable bearings in said standards and extending through said casing, an internal gear mounted upon the base and interposed between one of said blades and the adjacent standard, a hub secured to said shaft within said casing, a plurality of blades extending from said hub and provided with recesses in their outer ends, a disk mounted on said shaft within said casing, engaging said hub and provided with an elongated slot, a plurality of blades extending from said disk between the blades aforesaid and provided with recesses in their outer ends, spring pressed packing located in said recesses and engaging the inner wall of said casing, a disk located within said casing, a pin projecting from said disk and extending through said slot, a stub shaft projecting from said disk and extending through said casing, and a pinion keyed to said stub shaft and engaging said gear.

In testimony whereof I affix my signature.

DAVID LEWIS BALL.