W. A. RAGSDALE.

ROTARY MOTOR.

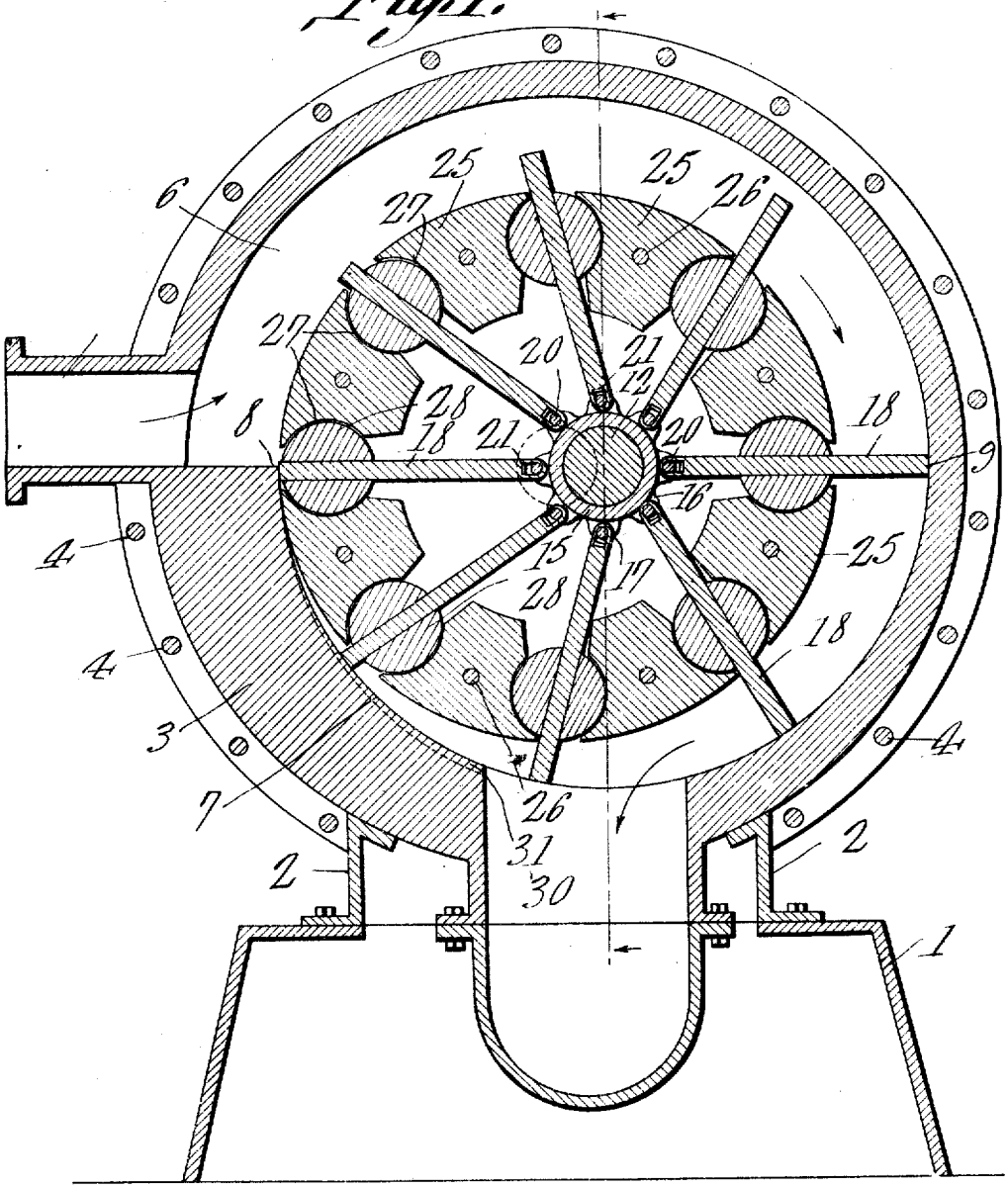
APPLICATION FILED MAY 4, 1911.

1,012,155.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

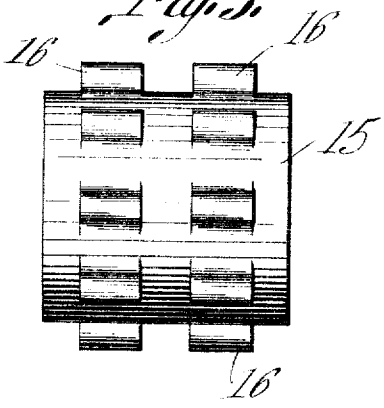

Fig. 4.

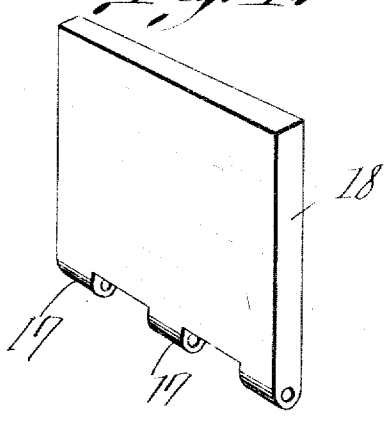

Fig. 5.

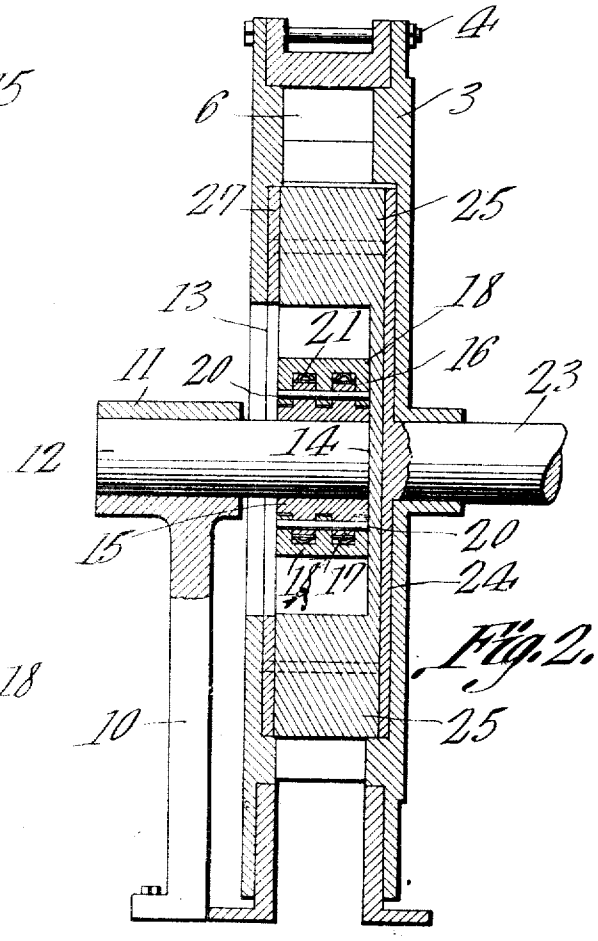

Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM ADRON RAGSDALE, OF TIE PLANT, MISSISSIPPI.

ROTARY MOTOR.

1,012,155. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed May 4, 1911. Serial No. 625,051.

To all whom it may concern:

Be it known that I, WILLIAM A. RAGSDALE, a citizen of the United States, residing at Tie Plant, in the county of Grenada and State of Mississippi, have invented a new and useful Rotary Motor, of which the following is a specification.

This invention relates primarily to rotary engines, although it may, of course, be utilized as a pump by reversing its operation.

The principal objects of the invention are to improve and simplify the construction of rotary engines, as well as to increase their efficiency in operation and to decrease the expense attending their manufacture and use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the use of a rotor having blades which are capable not only of rotary movement with the rotor and of sliding movement in a radial direction relative to the rotor but also of pivotal or oscillatory movement, whereby to permit the blades and rotor to rotate on centers eccentric to each other, and also to provide positively acting means for properly positioning the blades and the rotor in the casing so as to gain the best effects of the steam or of fluid pressure on the blades.

The invention also resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawing forming part of this specification: Figure 1 is a vertical view through a rotary engine constructed in accordance with the present invention; Fig. 2 is a vertical section taken at a right angle to Fig. 1, the base of the engine being omitted in this figure. Fig. 3 is a side elevation showing in detail the blade collar or ring to which the series of rotary and oscillatory blades are pivotally secured; Fig. 4 is a detail view showing, in perspective, one of the rotary and oscillatory blades; Fig. 5 is a detail view of one of the semi-cylindrical journal members which are mounted in the rotor and engage the blades so as to permit of their sliding and oscillatory movement with relation to the rotor.

Like reference numerals indicate corresponding parts in the different figures of the drawing.

The base 1 of the rotary engine may be of any suitable form and construction. Supported upon the base 1 by means such as the brackets 2 is the casing 3 formed in any suitable number of parts which are assembled and held together by means such as the bolts 4. The inlet of the casing 3 is indicated by the numeral 5. After entering the inlet 5 the fluid pressure passes around an eccentric curved chamber 6 formed in the upper half of the casing. The lower side wall of the casing 3 is semi-circular in form, as indicated at 7. That is to say, starting at the lower corner 8 of the inlet 5 the wall 7 continues as a true semi-circle downward and upward to the point 9, opposite the point 8. From the point 9 the inner wall of the casing begins to swing outward on an eccentric curve so as to produce the passage 6 as previously described.

The means for supporting the rotary and oscillatory blades will now be described. Extending upward from the base 1 as shown in Fig. 2, is a standard 10 having at its upper end a sleeve 11 in which is fixed in any suitable manner, a stub shaft 12 which projects through a circular opening 13 formed in one side plate of the casing 3. The stub shaft 12 terminates at the point marked 14 and serves as a bearing or support for a blade sleeve or collar 15 which is loosely mounted on the shaft 12 and is capable of rotation thereon. The blade collar or ring 15, as shown in Fig. 3, is provided on its outer face with perforated ears 16 which coöperate with similar ears 17 formed on the inner edges of the rotary and oscillatory blades 18, the ears 16 and 17 being pivotally connected with each other by means such as the longitudinally extending rods 20. For the purpose of pressing the blades 18 yieldingly outward, springs 21 which are bow shaped or of other suitable form are mounted in recesses in said blades, as shown best in Figs. 1 and 2, said springs bearing against the ears 16 and forcing the blades outwardly in such manner that they may yield slightly inwardly if necessary. The stub shaft 12 is concentric to the semi-circular lower portion

7—8—9 of the casing 3, so that the rotary blades will contact with the lower portion of the casing, as shown in Fig. 1, but not with the upper portion thereof.

Extending through the right hand wall of the casing 3, as shown in Fig. 2, is a shaft 23 which is intended to transmit the power of the device when used as a rotary engine. The shaft 23 is provided on its inner face with a fixed circular plate 24 which is arranged on the inside of the casing 3. The shaft 23 is eccentrically disposed with respect to the stub shaft 12, the eccentric position of the shaft 23 being indicated by the dotted circle in Fig. 1. Adjacent the periphery of the plate 24 a plurality of filling blocks 25 are secured thereto by means such as the bolts 26, said bolts also serving to secure in position a ring plate 27 which bears against the opposite faces of the series of filling blocks 25. The filling blocks are spaced from each other and are formed in their opposing faces with semi-cylindrical cut away portions 27 in which are fitted semi-cylindrical rocking members or cradles 28, the flat faces of which bear against the flat faces of the blades 18. The outlet for the steam or fluid pressure from the casing 1 is shown at the lower end thereof in Fig. 1 and is indicated by the reference numeral 30. Shallow grooves 31 may lead from the outlet 30 to the left on the inner wall of the casing to provide means for preventing steam from being trapped.

It is to be noted that the ring or rotor is made up of the plates 24, ring plates 27 and the filling blocks 25 and is so arranged in the casing 3 that it contacts in a steam tight manner with said casing at the point marked 8 at the lower portion of the inlet 5.

As shown clearly in Fig. 1 the inner wall of the upper half of the casing of the engine is concentric with the axis of the rotor and the lower half of the inner wall of the casing is concentric with the axis of the rotary blade. The effect of this formation of the casing wall is to produce a steam expansion chamber which is of uniform area from end to end, one end of said steam expansion chamber being formed by the exposed portion of the blade 18 at the right hand side of Fig. 1 and the other end of said steam expansion chamber being formed by an abutment indicated below the reference numeral 8 at the left hand side of Fig. 1, it being obvious that the abutment and exposed portion of the blade 18 are of the same area, whereby full expansive efficiency of the steam or other fluid is secured. The abutment, it will be noted, extends between the lower portion of the casing which is concentric with the axis of the blade and the other portion of the blade which is concentric with the axis of the rotor.

Constructed as described the operation of the rotary engine is as follows: The fluid pressure enters through the inlet 5 and passes around through the eccentric passage 6. At the point indicated by 9 one of the rotary and oscillatory blades 18 first comes into contact with the semi-circular lower wall of the casing and forms a steam tight joint therewith. The steam thus engages this blade and drives it around to such position that the steam exhausts or escapes through the outlet 30, the grooves 31 preventing any of the steam being trapped at a point beyond said outlet. By reason of the fact that the series of blades 18 and rotor made up of the filling blocks 25 and plate 24 rotate about different axes, it is necessary that said blades 18 should be capable of pivotal or oscillatory movement to accommodate themselves to the rotor and this pivotal or oscillatory movement of the blades is permitted by the rocking members 27. The rocking or oscillatory movement of the blades 18 is shown clearly in Fig. 1 wherein the oppositely disposed blades which are shown in horizontal position are radial to the blade collar 15, but the uppermost and the lowermost blades 18 instead of being in vertical position, are shown inclined or oscillated to the left, this leftward oscillation being rendered necessary by the eccentric relation of the axis of the blades to the axis of the rotor. It will be understood that the movement of the blades 18 is transmitted to the rotor and from the rotor the movement is transmitted to the driving shaft 23. If it be desired to use the device as a pump, it is only necessary to apply the power to shaft 23 and connect the inlet 30 with the fluid to be pumped.

What is claimed as new is:—

1. A rotary engine provided with a rotor having its axis at one point, rotary blades having their axes at another point, and a casing having one part of its inner wall concentric with the axis of the rotor and another part of its inner wall concentric with said blades, said concentric portion having at one end thereof an abutment of the same area as the exposed portion of the blade against which the pressure is acting.

2. A rotary engine provided with a rotor having its axis at one point, rotary blades having their axes at another point and a casing provided with an abutment and having part of its inner wall concentric with the axis of the rotor and part of its inner wall concentric with the axes of said blades, the abutment being of the same area as the exposed portion of the blade against which the pressure is acting.

3. A rotary engine comprising a casing, a rotor therein, having its axis at one point, rotary and oscillatory blades therein having

their axes at another point and a steam expansion chamber in said casing having an abutment at one end, the other end of said expansion chamber being formed by one of said blades, the exposed portion of said blade being of the same area as said abutment.

4. A rotary engine provided with a rotor having its axis at one point, rotary and oscillatory blades having their axes at another point, a casing having an inner wall, part of which is concentric with the axis of the rotor and part of which is concentric with the axes of the blades, said casing being formed with an abutment, said rotor touching the inner wall of said casing adjacent said abutment, there being a steam expansion chamber around said rotor, one end of said chamber being formed by said abutment and the other end of said chamber being formed by one of said blades, the exposed portion of the blade being of the same area as the abutment, and means for supplying fluid to said expansion chamber.

5. A rotary engine comprising a casing, an inlet and an outlet for said casing, a shaft extending through one face of said casing, and having a rotor fixed thereon, part of the inner wall of said casing being concentric with the axis of said rotor shaft, a stub shaft extending into the opposite face of said casing and having a plurality of rotary and oscillatory blades connected therewith, the axes of said blades being located away from the axis of said rotor, a part of the inner wall of said casing being concentric with said stub shaft, said blades projecting laterally through the rotor and engaging the concentric portion of the casing, said casing having an abutment extending between the two concentric portions thereof, the abutment being of the same area as the exposed portion of the blade against which the pressure is acting.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM ADRON RAGSDALE.

Witnesses:
F. B. OCHSENREITER,
LENA WILLSON.