No. 864,979. PATENTED SEPT. 3, 1907.

J. A. MOSHER.

ROTARY ENGINE.

APPLICATION FILED AUG. 27, 1906.

2 SHEETS—SHEET 1.

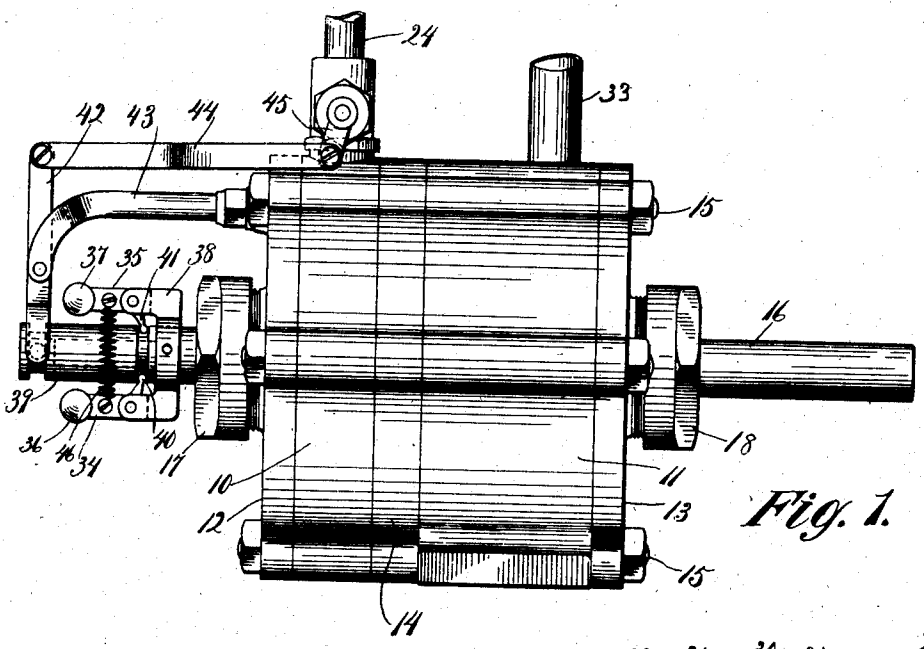


Fig. 1.

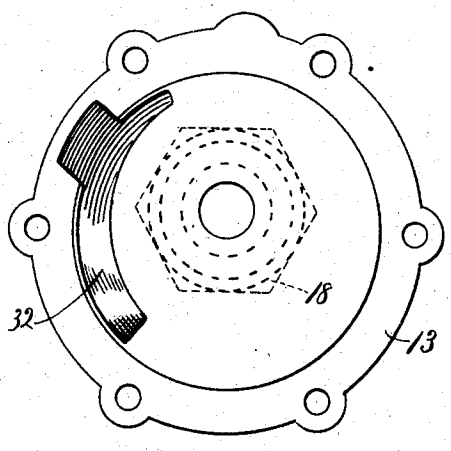


Fig. 5.

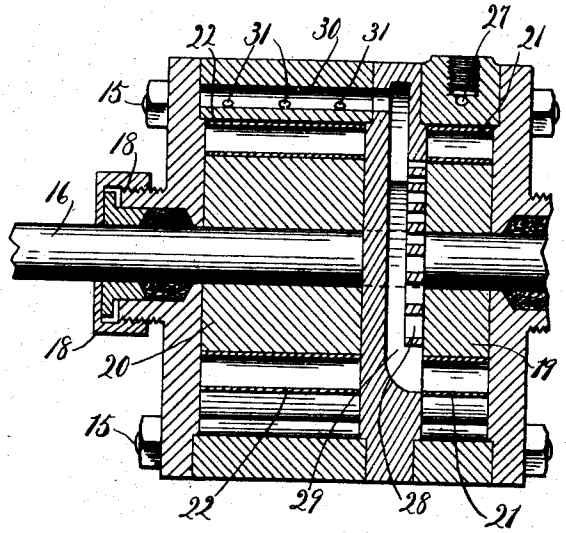


Fig. 6.

Witnesses:
W. H. Cotton
Charles B. Gilleon.

Inventor:
John A. Mosher.
By Louis A. Greeson Atty

No. 864,979. PATENTED SEPT. 3, 1907.

J. A. MOSHER.

ROTARY ENGINE.

APPLICATION FILED AUG. 27, 1906.

2 SHEETS—SHEET 2.

Fig. 4.

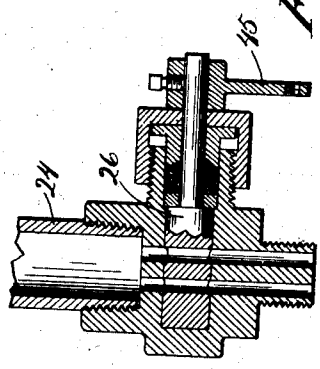


Fig. 3.

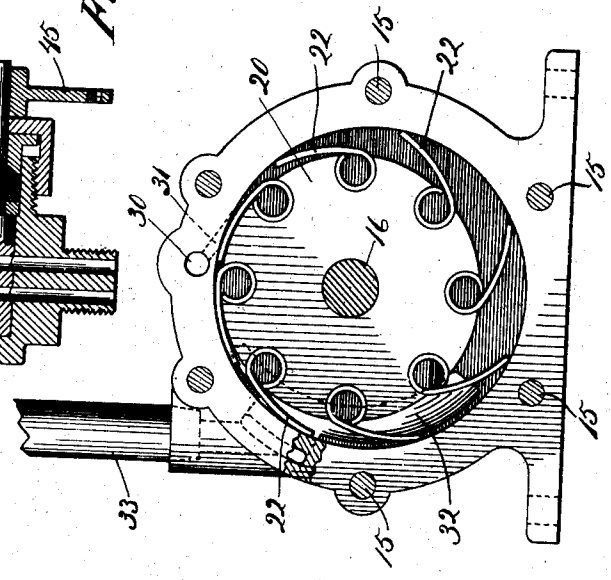
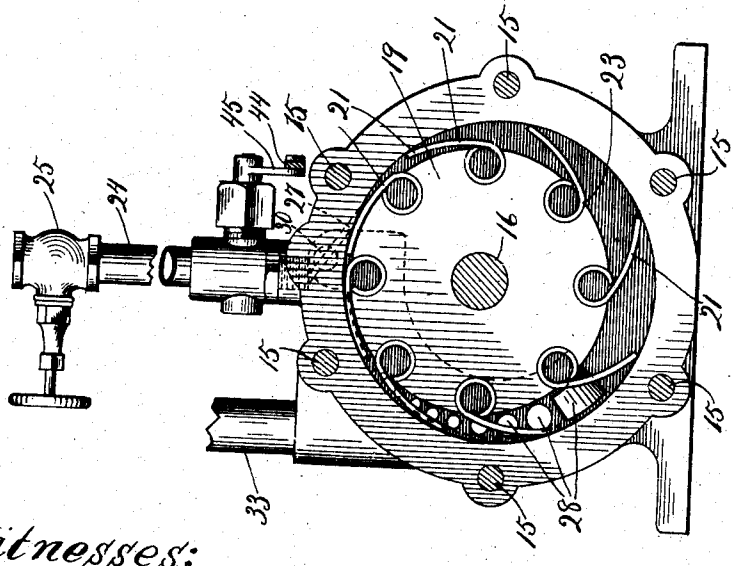


Fig. 2.



Witnesses:
W. H. Cotton.
Charles B. Gillson

Inventor:
John A. Mosher.
By Louis T. Gleason Atty.

UNITED STATES PATENT OFFICE.

JOHN A. MOSHER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ADAMS & WESTLAKE COMPANY, A CORPORATION OF ILLINOIS.

ROTARY ENGINE.

No. 864,979. Specification of Letters Patent. Patented Sept. 3, 1907.

Application filed August 27, 1906. Serial No. 332,207.

To all whom it may concern:

Be it known that I, JOHN A. MOSHER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to that type of rotary engines adapted for use in connection with a fluid, such as steam or air, and in which a rotary head is located eccentrically within a circular chamber and carries wings or blades which are extended to contact with the inner peripheral wall of the chamber, the motive fluid being admitted back of such blades as they pass the point at which the rotatable head is closest to such wall, and being carried off through an exhaust port as the blade again approaches this portion of its cycle.

The object of the invention is to simplify the construction of engines of this type and secure a high degree of efficiency; and the invention consists in the structure hereinafter described, and which is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the engine; Fig. 2 is a transverse section through its high pressure chamber; Fig. 3 is a similar view through its low pressure chamber; Fig. 4 is a sectional detail of the regulating valve; Fig. 5 is a detail of one of the cover plates of the chamber; and Fig. 6 is a longitudinal section of the motor, central through most of its extent but carried through a series of exhaust ports connecting the two sections of the engine.

The engine may be used as a simple high pressure motor, or may be used as a compound engine, the exhaust from its high pressure section being carried into a low pressure section, the fluid being there used expansively.

The casing of the engine is shown as comprising a pair of cylinders 10, 11, one forming the circumferential walls of the high pressure and one forming the circumferential walls of the low pressure chambers; a pair of end plates 12, 13, and a division plate 14 for separating the two chambers, the whole being secured together by means of bolts 15 passing through suitable lugs and ribs formed on the several members of the casing.

The cylinders 10, 11, have a circular bore, and through the casing there extends longitudinally a rotatable shaft 16, set eccentrically to the bore of the cylinders, suitable stuffing boxes, as 17, 18, being provided for preventing the escape of driving fluid at the bearings of this shaft. Within each of the chambers of the motor is located a circular head 19, 20, these heads being fixed upon the shaft 16 and being of such length that each is in frictional engagement with both of the side walls of the chamber within which it is housed. Each of these heads carries a plurality of oscillating blades 21, 22, curved to conform to the outer surface of the head and adapted to swing outwardly as the head is turned, their outer edges remaining in constant contact with the inner surface of the cylinders.

The blades of the two sets are alike except in length, therein conforming to the head within which they are mounted, their side edges being in contact with the side walls of the chamber. The inner end of each wing is bent to cylindrical form to constitute a pivot or hub upon which it may be turned. This pivot portion 23 is fitted within a segmental pocket extending across the peripheral face of the head, this pocket comprising more than half of a circle. These wings are preferably formed of sheet metal, and the head is so located within the casing that at its nearest point of approach to the cylindrical surface thereof just enough space is provided to accommodate the wing when folded against the head.

A supply pipe 24 is connected with the cylinder 10, and is provided with a throttle valve at 25 and a governor-controlled regulating valve 26. This pipe delivers fluid under pressure through a duct 27, entering the chamber of the high pressure motor tangentially at the point at which the space between the head 19 and the inner surface of the cylinder 10 is wider than the thickness of the wing 21. The wing commences to turn on its pivot as its end passes this steam duct, centrifugal force, supplemented by the entrance of pressure below it, insuring the outward swing. A pocket is thus formed between the opening wing and the one next following it, and pressure being thus applied to the rearward face of the wing the head 19 is driven forward. When the next wing passes the induction port, the fluid within the pocket which is thus cut off acts expansively and is effective so long as the forward wing inclosing it continues to open outwardly more rapidly than does the wing at the rear of the pocket. At a point at which this pocket reaches its maximum size, the advance wing encounters the first of a series of eduction ports 28, in the division plate 14. These ports lead to an exhaust cavity 29 in the division plate, which discharges into a duct 30 formed in the wall of the cylinder 11, from which lead a series of ports 31 to the chamber of this cylinder, such ports opening tangentially and in the same relation to the head 20 and the wings 22 as does the port 27 with reference to the head 19 and wings 21.

The action of the head 20 and its appurtenances is the same as in the high pressure cylinder, and as the wings 22 begin to fold inwardly they uncover an exhaust cavity 32 which delivers to the exhaust pipe 33. A suit-

able centrifugal governor may be applied to the engine, and, as shown, is mounted on the shaft 16 and comprises a pair of pivoted arms 34, 35, each carrying a ball 36, 37, and being pivoted to a yoke 38 fixed upon the shaft 16. These arms 34, 35, are in the form of bell-cranks, their inner ends engaging a recess in a sleeve 39, as shown at 40, 41. The sleeve 39 is fitted and slides longitudinally upon a reduced end of the shaft 16, and is engaged by the yoke of and actuates a lever 42, which is fulcrumed upon a bracket 43 and is connected by means of a link 44 with the crank arm 45 fixed upon the stem of the valve 26. The arms 34 and 35 are united and drawn together by a spring 46. As the engine obtains a certain speed, the valve 26 begins to close by reason of the outward movement of the free ends of the arms 34, 35, and the consequent movement of the sleeve 39.

The engine is exceedingly simple and cheap of construction. The fluid pressure upon its wings serves as a packing by forcing them against the inner face of the cylinder and against the forward face of the recesses within which they are pivoted. The wings are inexpensive and without any complication in the way of separate pivots, and hence are cheaply and easily replaced as they become worn. They are of such length that they may wear away considerably at their outer ends before the efficiency of the engine is in any wise impaired.

A very high speed may be attained, and the engine runs smoothly and without vibration.

I claim as my invention—

1. In a rotary engine, in combination, a casing, a rotatable head within the casing and having in its periphery a transverse pocket whose walls are curved to the arc of a circle, and an oscillatable wing of sheet metal bent to form a hub comforming to and fitting within the pocket.

2. In a rotary engine, in combination, a casing, a rotatable head within the casing and having in its periphery transverse pockets whose walls are curved to the arc of a circle, and oscillatable wings, each wing being of sheet metal bent to form a hub comforming to and fitting within one of the pockets.

JOHN A. MOSHER.

Witnesses:
E. M. KLATCHER,
M. V. MCGRATH.