No. 822,343. PATENTED JUNE 5, 1906.

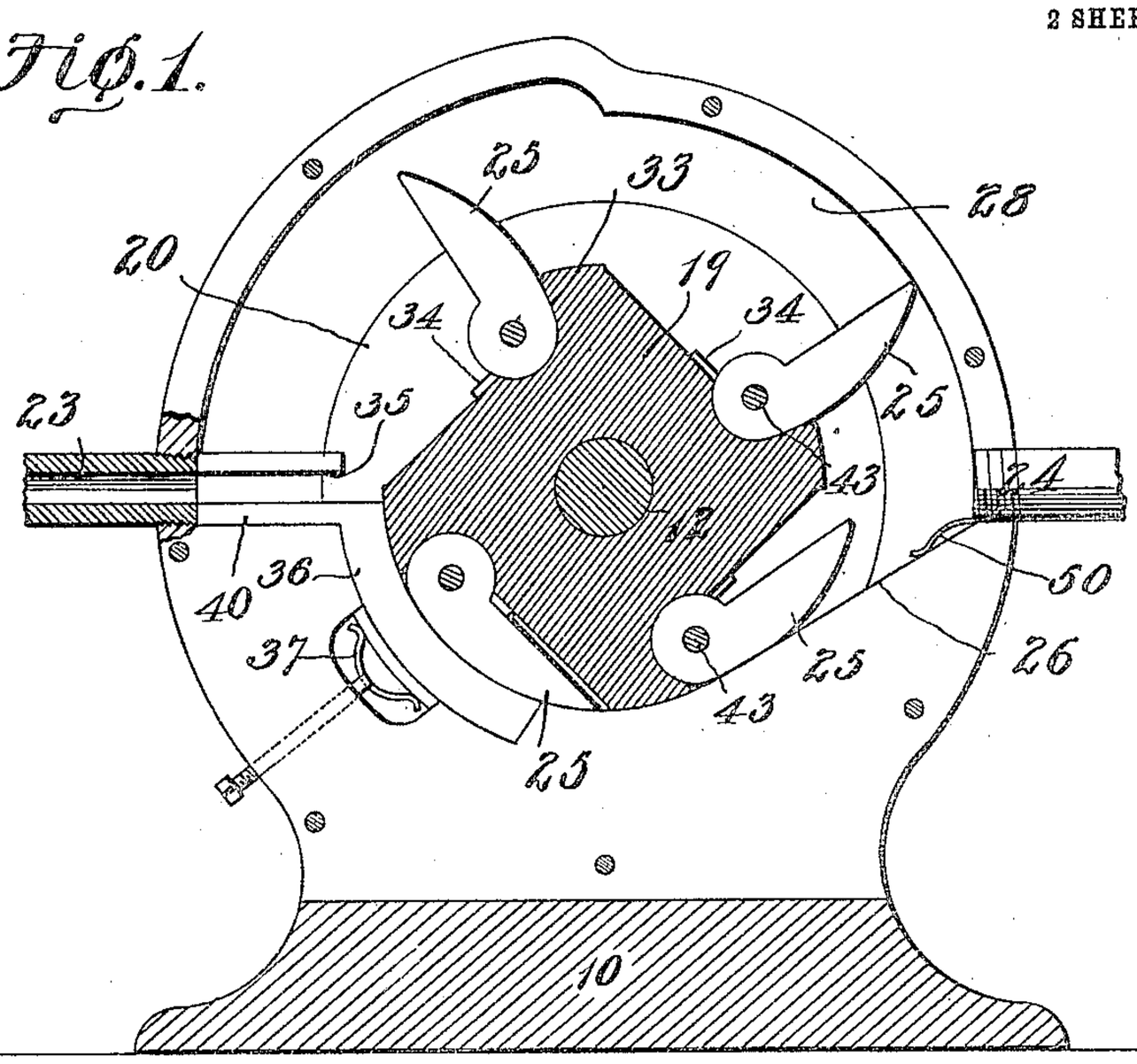
C. M. CAGLE.

ROTARY ENGINE.

APPLICATION FILED APR. 3, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



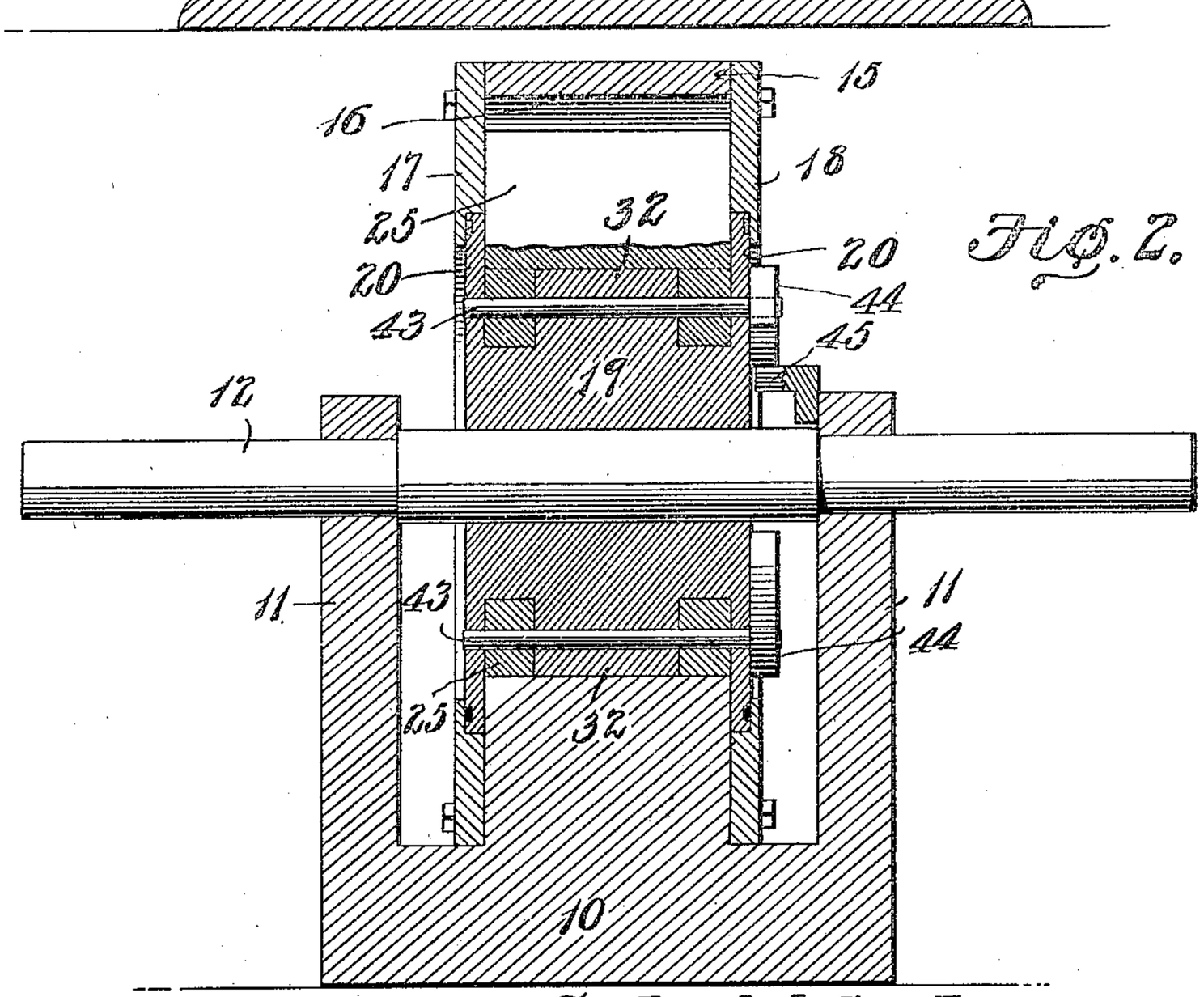


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

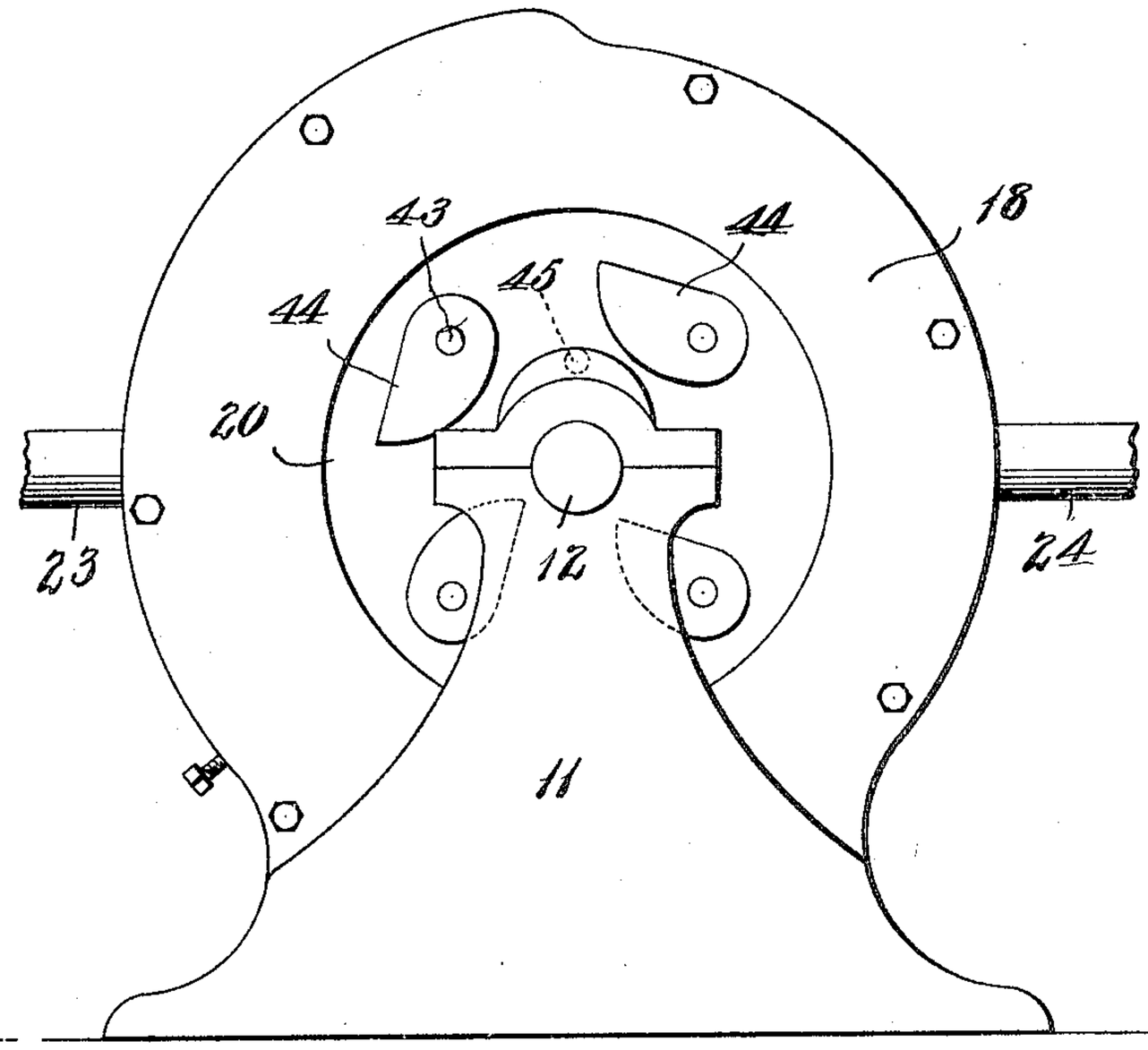
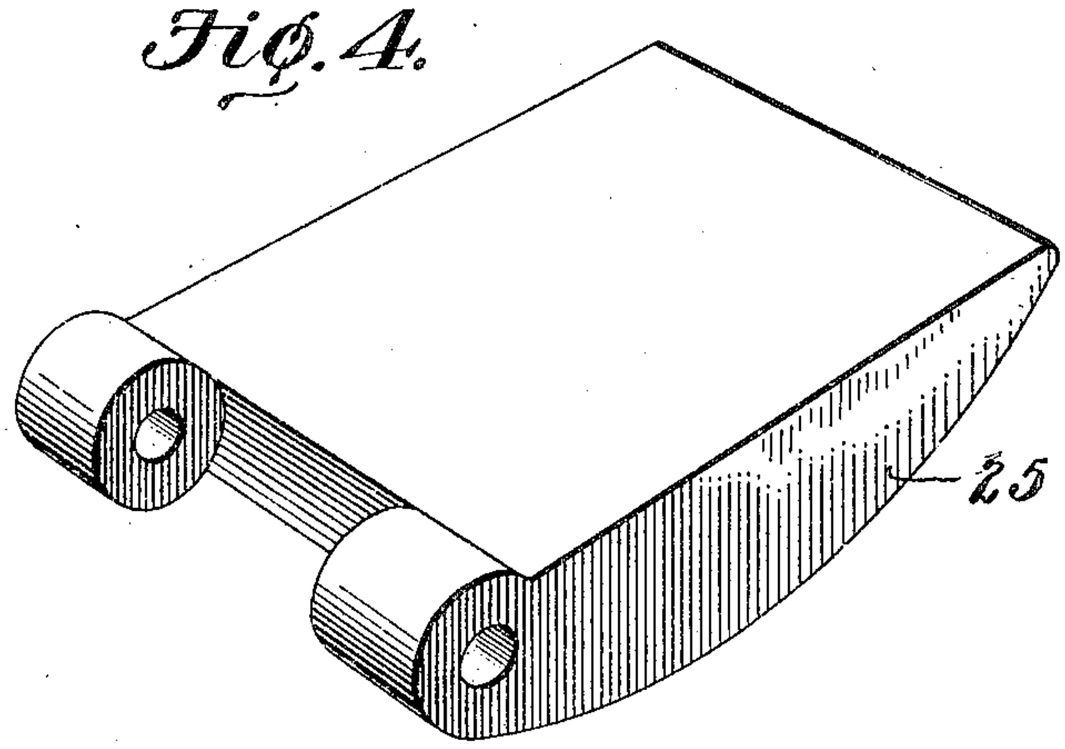


Fig. 4.



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UNITED STATES PATENT OFFICE.

CARTER M. CAGLE, OF BECKVILLE, TEXAS, ASSIGNOR OF ONE-HALF TO LEE C. PRUITT, OF BECKVILLE, TEXAS.

ROTARY ENGINE.

No. 822,343. Specification of Letters Patent. Patented June 5, 1906.

Application filed April 3, 1906. Serial No. 309,623.

To all whom it may concern:

Be it known that I, CARTER M. CAGLE, a citizen of the United States, residing at Beckville, in the county of Panola and State of Texas, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to rotary engines, and has for its principal object to provide an engine of simple and compact construction, in which the pressure and expansive force of the steam or other actuating fluid may be utilized to the fullest advantage.

A further object of the invention is to provide a novel form of rotary engine in which a piston-drum carries a plurality of pivotally-mounted wings that are arranged to move outward within a steam-space and assume operative position in advance of their entrance into the active pressure-space of the cylinder and without interfering with the action of the fluid-pressure on piston-wings previously moved to operative position.

A still further object of the invention is to provide a novel form of cushioning means arranged to be engaged by the piston-wings as the latter are folded in toward the periphery of the piston-drum.

A still further object of the invention is to provide an improved packing which will prevent the passage of steam below the piston-drum.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of a rotary engine constructed in accordance with the invention. Fig. 2 is a transverse sectional elevation of the same. Fig. 3 is an elevation of one side of the engine. Fig. 4 is a detaii perspective view of one of the piston-wings detached.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The engine is provided with a suitable base or bed-plate 10, carrying standards 11, at the upper ends of which are bearings for the reception of the engine-shaft 12, the latter being provided with a belt-wheel or the like, through which the power may be transmitted to any mechanism to be driven.

Between the standards is arranged the cylinder 15, comprising an approximately circular central member 16, having side flanges 17 and 18, and within the cylinder is a piston-drum 19, that is rigidly secured to the shaft 12. The piston-drum is shown in the present instance as of generally rectangular contour, and its opposite sides are provided with circular flanges 20, which fit against the flanges 17 and 18 of the stationary cylinder in such manner as to form fluid-proof joints.

The cylinder is provided at one side with a port 23 for the admission of steam or other actuating fluid, and at the opposite side is an exhaust-port 24, the two ports being approximately diametrically opposite each other. That portion of the inner wall of the cylinder which extends from the lower wall of the inlet-port to a point adjacent to the exhaust-port is curved to conform to the periphery of the piston-drum 19, and the folded piston-wings 25, and from the end of this curved portion of the cylinder the wall extends tangentially to form an inclined shoulder 26, that terminates at the lower wall of the exhaust-port 24.

The upper portion of the cylinder is divided into a pressure-space 28, that extends from approximately the vertical plane of the axis of shaft 12 to the exhaust-port, the curved wall of this portion of the cylinder being struck from the center of the shaft 12 and at such distance therefrom that the outer edges of the piston-wings 25 will be in contact with said wall during this portion of the movement. That portion of the cylinder from the upper wall of the inlet-port 23 to the vertical plane of the axis of shaft 12 is of greater width than the pressure-space 28 and normally constitutes a steam-chest into which the piston-wings enter, and at this point the piston-wings are moved outward to operative position.

The periphery of the piston-drum is provided with a plurality of equidistantly-spaced pivot-lugs 22, at the opposite sides of which are recesses, and one wall of each recess is extended to form an approximately radial stop 23, which limits the outward movement of the piston-wing 25 and forms a strong backing that will prevent excess movement of the piston-wing. That portion of the piston-drum in advance of each of the pivot-lugs 32 is recessed to receive the piston-wing when folded, and the lower wall of this recess carries a cushioning-block 34, on which the piston-wing may rest when folded, the block, however, serving to maintain a space between the inner wall of the piston-wing and the piston-drum proper, so that when the piston-wing arrives within the steam-space the pressure of steam between the wing and drum will have a tendency to move the wing outward to operative position, and this operation is further assisted by the upper wall 34 of the inlet-port, which is extended inward to a point adjacent to the periphery of the piston-drum in such manner that the stream of fluid entering at the port will be directed upward and partly behind the successive piston-wings and will move the latter outward.

When the piston-wing has been projected to its fullest extent within the steam-space, there is still a clear annular space between the outer end of the piston-wing and the curved wall of the cylinder, and the steam or other fluid may freely pass this wing and act upon the piston-wing within the pressure or working space 28.

In order to prevent the leakage of steam below the piston-drum, a packing-block 36 is placed immediately below the inlet-port, its inner face being curved to conform to the contour of the piston, and said block is pressed toward the piston-drum by means of a suitable spring 37. To the upper end of this block is secured a slidable plate 40, that forms the lower wall of the inlet-port, so that leakage of steam or other fluid around the packing-block or between the block and the drum will be prevented.

The piston-wings 25 are secured to the inner ends of shafts 43, that are extended outward through the head or flange 18 of the piston-drum, and are provided at their outer ends with levers 44, which are arranged to engage with a cam or cams 45, carried by one of the pillow-blocks or standards 11, the function of the cam being to assist in moving the piston-wings toward and from the periphery of the piston-drum.

During the operation of the engine the steam or other fluid entering through the port 23 will be directed under the successive piston-wings and will tend to move the same outward to an approximately radial position with respect to the piston-drum, this movement being made positive by the engagement of the piston-wing levers 44 with the cam 45. After the piston-wing is fully extended there is still considerable space between the outer end of the wing and the adjacent curved wall of the cylinder, so that the fluid is free to act on the piston-wing which has been previously advanced to a position within the pressure or working space 28, and when the piston-wing which has been moved outward reaches the beginning of this pressure-space it will cut off the flow to the previous piston-wing; but the pressure will act thereon until a following piston-wing enters the pressure-space.

When the piston-wing reaches the exhaust-port, its curved surface strikes against one or more springs 50, disposed on the annular shoulder 26, and these serve to take up the shock or jar incident to the inward movement of the piston-wing, so that the latter will turn freely against the piston-drum.

I claim—

1. In a rotary engine, a cylinder having a pressure or working space, and an enlarged space or steam-chest, a revoluble piston-drum arranged within the cylinder and having a portion of its periphery in contact with a portion of the curved wall of the cylinder, inlet and exhaust ports for the actuating fluid, and a plurality of pivotally-mounted wings carried by the drum and arranged to move outward to approximately radial position in advance of their movement into the pressure-space.

2. In a rotary engine, a cylinder having inlet and exhaust ports, and provided with a pressure-space and with an enlarged space or steam-chest, a revoluble piston-drum having a portion of its periphery engaging a portion of the circular wall of the cylinder, a plurality of piston-wings pivoted to the drum and movable outward from said drum while passing through the enlarged space or steam-chest, and means for moving the piston-wings toward and from the periphery of the drum.

3. In a rotary engine, a cylinder having inlet and exhaust ports, a piston-wing disposed within the cylinder, a curved packing-block, a spring for forcing the same into engagement with the periphery of the piston-drum, and a plate secured to said block and forming one of the walls of the inlet-port.

4. In a rotary engine, a cylinder having a circular wall divided into portions of different radial extent, there being an inclined shoulder connecting two of the curved walls of different radii, a revoluble piston-drum having a portion of its periphery in contact with that portion of the cylinder-wall nearest the axis

of rotation of the piston-drum, a pivotally-mounted piston-wing carried by the drum, and yieldable members adjacent to said inclined shoulder, and with which the wings engage as they pass from operative position to be folded against the piston-drum.

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

C. M. CAGLE.

Witnesses:
J. M. MOOSE,
W. T. ROUSSEAU.