M. H. DOWLING.

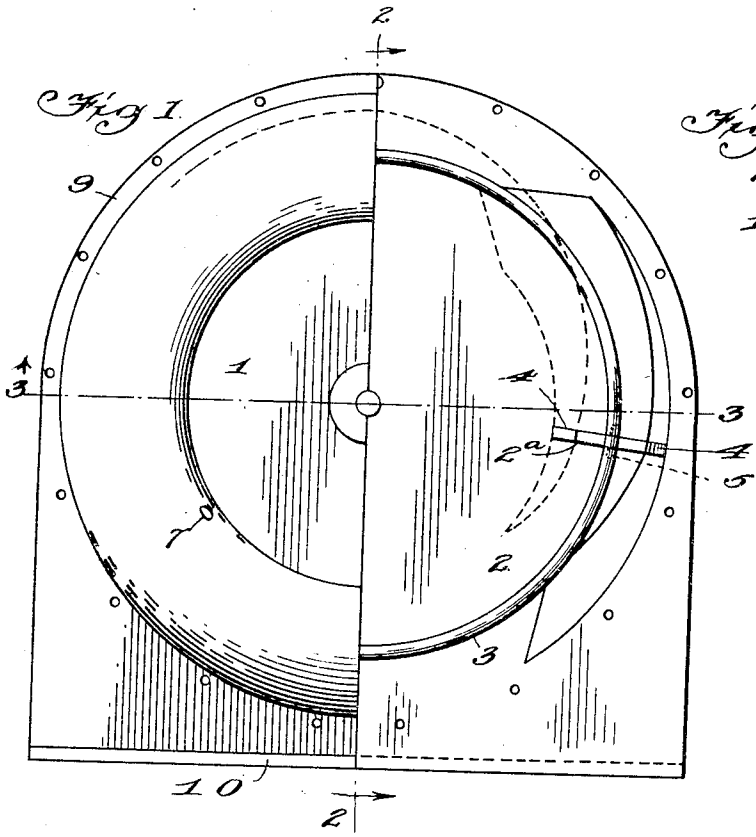
ROTARY MOTOR OR PUMP.

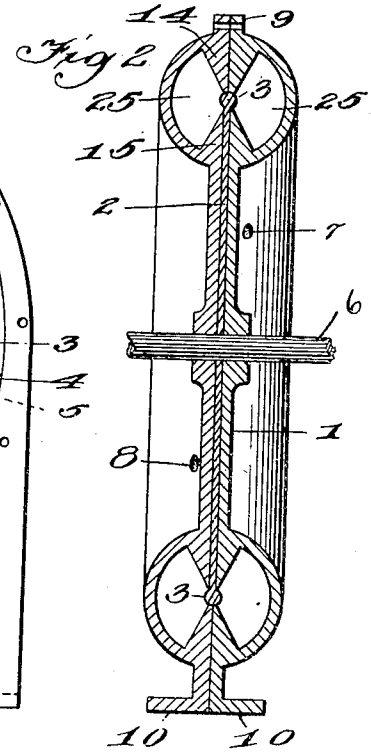
APPLICATION FILED SEPT. 17, 1908.

926,731.

Patented July 6, 1909.

2 SHEETS—SHEET 1.





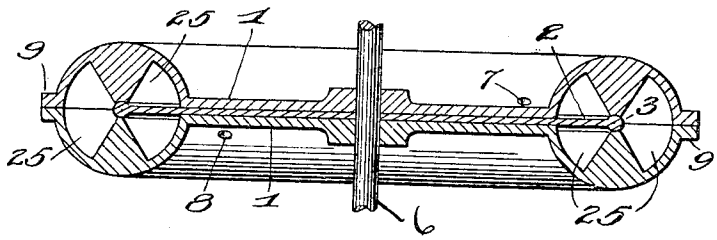


Fig. 3.

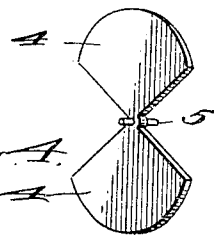


Fig. 4.

Witnesses

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M. H. DOWLING.

ROTARY MOTOR OR PUMP.

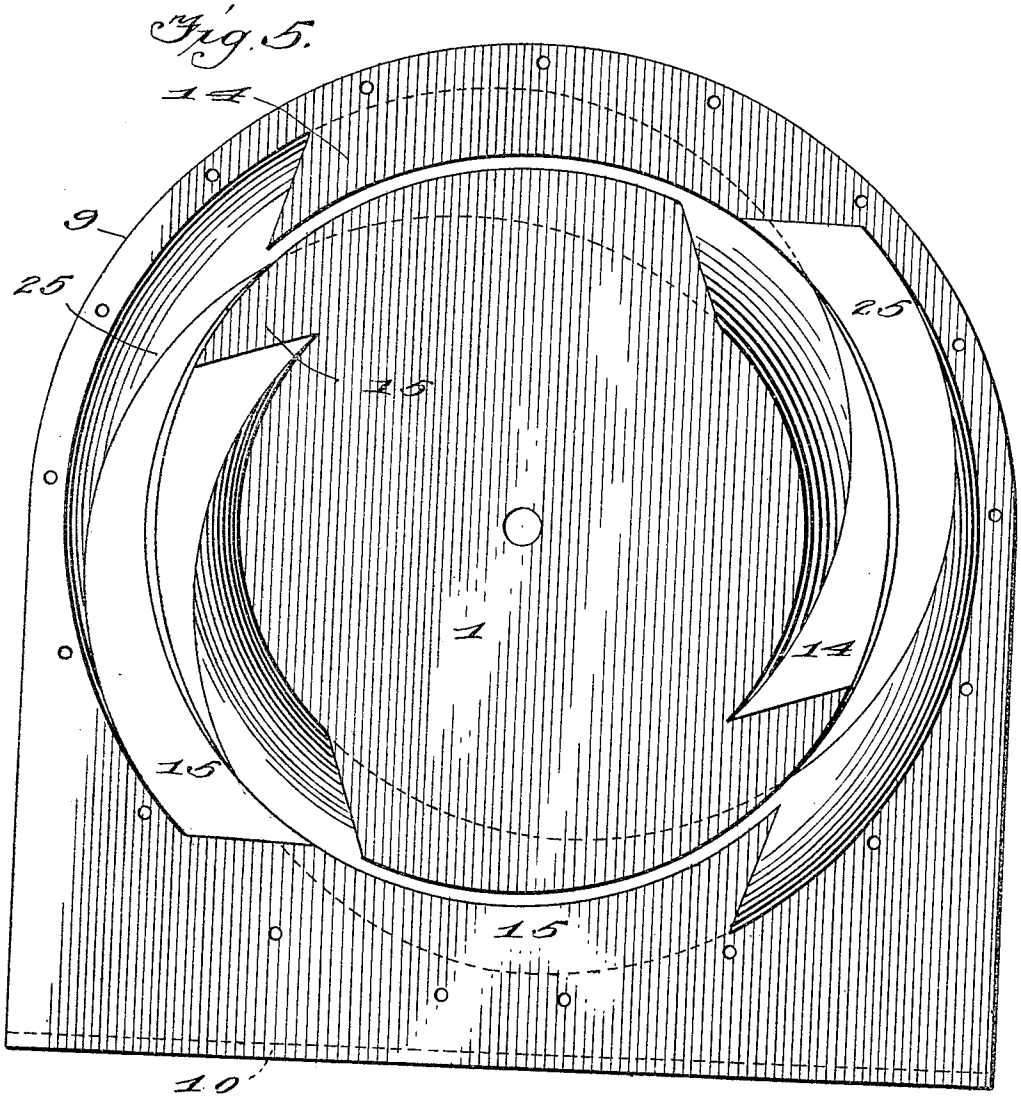
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2 SHEETS—SHEET 2.

Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

MICHAEL H. DOWLING, OF MACEDONIA, OHIO.

ROTARY MOTOR OR PUMP.

No. 926,731. Specification of Letters Patent. Patented July 6, 1909.

Application filed September 17, 1908. Serial No. 453,418.

To all whom it may concern:

Be it known that I, MICHAEL H. DOWLING, a citizen of the United States, residing at Macedonia, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Rotary Motors or Pumps, of which the following is a specification.

This invention is a rotary motor or pump, and will be hereinafter described mainly with respect to its use as an engine, with the understanding, however, that it may be used as a pump in a manner to be referred to.

The object of the invention is to produce an engine or pump of the rotary type which will be without valves or other movable regulating parts, the structure comprising only five parts which can be very easily and cheaply constructed and which will develop high speed and great power in proportion to the motive fluid supplied.

Speaking generally, the engine comprises two similar casings producing an annular chamber in which are two endless worms or spiral partitions, a circular plate located between the sides of the casing and rotatable with the shaft therein, and a piston carried by the plate, at the periphery, which piston travels and also rotates on its own axis, in the chambers formed by the partitions.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation, half of one side of the casing being broken away. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a perspective view of the piston. Fig. 5 is a plan view of the inner side of one of the casings.

Referring specifically to the drawings, 1 indicates duplicate casings bolted together at the peripheral edges 9 and formed with a base 10. Each casing has an annular groove or recess therein, and when the casings are set together an annular space is formed which is substantially circular in cross section, and this space is divided into opposite chambers 25 by means of spiral partitions or worms 14 and 15 formed by corresponding projections on the respective halves of the casing. These partitions are curved or inclined to form a one-quarter thread or turn for each one-quarter of the annular cylinder, as will be evident from a comparison of Figs. 2 and 3; or, in other words, make one complete turn around the whole length of the cylinder.

The central portions of the halves of the casing are spaced from each other, to allow the rotation of a circular disk 2 therebetween, the disk being fast upon the main shaft 6. This disk has an enlarged rim 3 which fits and fills the space between the opposite or inner edges of the partitions 14 and 15, the said edges being spaced apart and shaped to correspond. Two pistons are carried by the disk, each of which consists of a pair of wings 4, the shape and size of each wing corresponding to the cross sectional area of the chambers 25. Each piston is mounted upon a pivot pin 5 the ends of which are seated in bearings formed for the purpose in the rim 3, at the sides of a slot 2^a, cut in the edge of the rim; and the pistons are carried by the disk with their planes at a right angle to that of the disk, the wings of the piston being located in the chambers 25, which extend around the cylinder spirally, in consequence of the spiral shape of the partitions 14 and 15. These partitions proceed in a regular spiral around the cylinder, and when motive fluid is admitted to the chambers the wings of the pistons receive the pressure thereof in the respective chambers. Each partition is formed of two one-half walls, due to the split casing, but the line of the division is all in the same plane, thereby cutting said partitions at an angle equal to the angle of the spiral. The two walls forming the partition 14 are separated by a space to permit the passage of the edge of the disk 2. The inlets for the steam or other motive fluid are indicated at 8, and the outlets at 7 at points substantially 90° distant therefrom, (some space being allowed for clearance) and on the opposite side of the cylinder or casing.

In operation, steam or other motive fluid entering at the inlets 8, into the chambers will force the pistons along in the chambers toward the exhausts, thereby revolving the disk and the main shaft, and at the same time the pistons will rotate on their pivots 5 in consequence of the spiral shape of the partitions. The chambers in which the pistons travel cross over, so to speak, from one side of the casing to the other, allowing the motive fluid to exhaust through the outlets 7 which are on the opposite side of the casing to the inlets; and the operation is repeated as the pistons successively pass the inlets 8. By having the motive fluid enter the ports 7 the engine may be reversed. Suitable cut

off devices may be provided to utilize the expansion of the motive fluid in each chamber.

In using the machine as a pump, one chamber is utilized as a power chamber and the other as a chamber for the fluid to be forced. In this event the motive fluid is let in at one of the inlets 8 and exhausts through the corresponding inlets 7, and the fluid to be forced is drawn in through the other inlet 8, behind the wing in the piston in the other chamber, and forced out through the corresponding outlet 7, whereby one chamber acts as a suction pump, the power being supplied to the other. At high speed this will be found very effective since the action is practically continuous.

I claim:

1. The combination of a casing having therein an annular cylinder, spiral partitions in the cylinder forming opposite spiral chambers having inlets and outlets, a disk revoluble in the casing and cylinder, and a piston carried by the disk and having wings which travel in the chambers, the piston being pivotally mounted on the disk so that it may turn in consequence of the spiral shape of the chambers, the pivot of the piston being tangential to the disk.

2. The combination of a casing formed of opposite side plates and having an annular cylinder therein, spiral partitions extending around within the cylinder, dividing the same into opposite spiral chambers, a disk revoluble between the side plates of the casing and projecting at its outer edge into the cylinder, and a piston pivotally carried at the outer edge of the disk and having opposite wings which travel in the respective chambers, the pivot of the piston being tangential to the disk.

3. The combination of a casing having therein an annular cylinder, spiral partitions in the cylinder forming opposite spiral chambers having inlets and outlets, a disk revoluble in the casing and cylinder, the disk having radial slots in the periphery, pistons pivoted tangentially to the disk to turn in said slots and having opposite wings projecting from the disk and across the respective chambers, the plane of the pistons being at a right angle to that of the disk.

4. The combination of a casing made of opposite side plates having a central portion spaced apart and a peripheral portion shaped to form an annular cylinder, partitions extending spirally across and around in the cylinder, forming two spiral chambers therein having inlets and outlets, a disk revoluble between the central portion of the plates and projecting at its outer edge into the cylinder, the said edge being slotted radially, and pistons pivotally mounted in said slots and having wings extending across the chambers, the pivots of the piston being tangential to the disk.

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

MICHAEL H. DOWLING.

Witnesses:

DANIEL J. MALONEY,

MONROE E. MILLER.