No. 835,045. PATENTED NOV. 6, 1906.

A. E. STOKER.

ROTARY MOTOR.

APPLICATION FILED APR. 14, 1906.

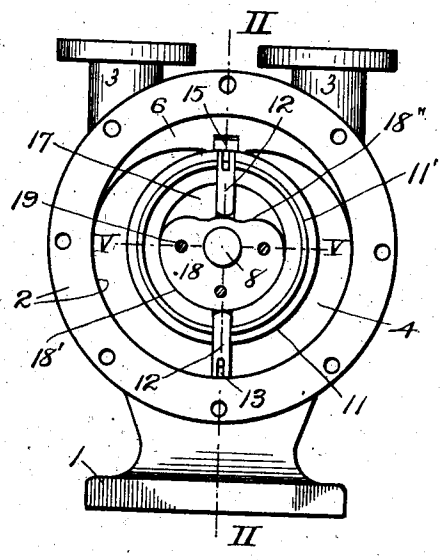

Fig. 1.

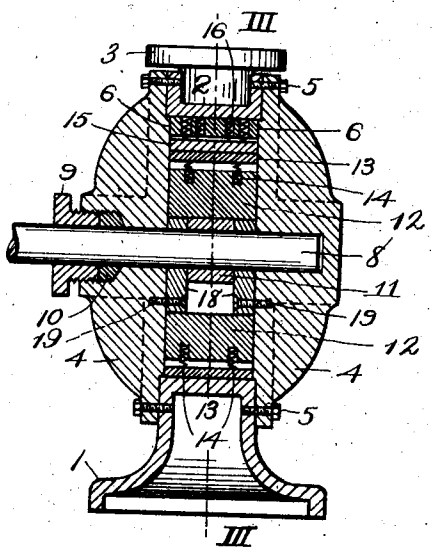

Fig. 2.

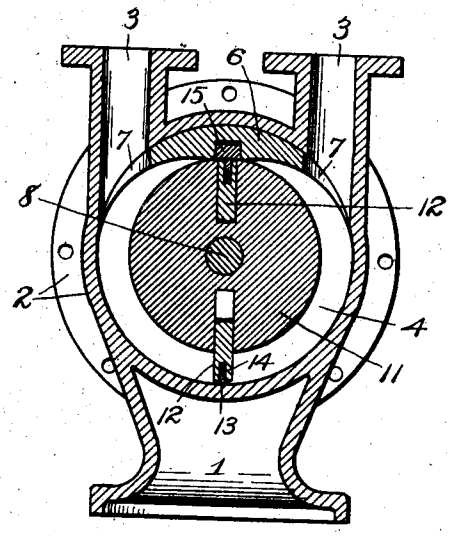

Fig. 3.

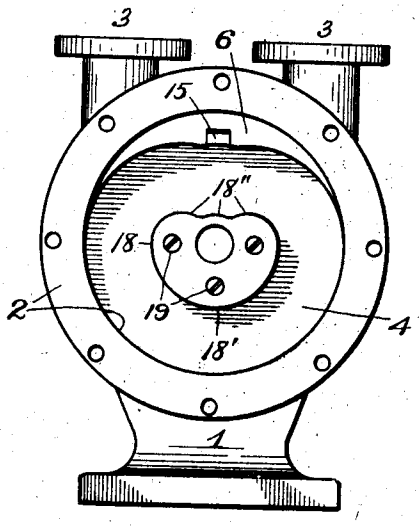

Fig. 4.

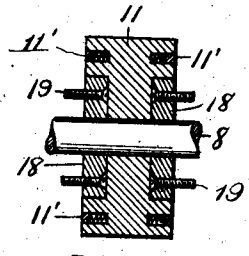

Fig. 5.

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UNITED STATES PATENT OFFICE.

ALBERT E. STOKER, OF KANSAS CITY, MISSOURI.

ROTARY MOTOR.

No. 835,045. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed April 14, 1906. Serial No. 311,775.

To all whom it may concern:

Be it known that I, ALBERT E. STOKER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Rotary Motors, of which the following is a specification.

My invention relates to rotary motors of that class which are operated by a fluid under pressure and of that construction in which one or more radially-moving piston-slides are caused to revolve within a chamber provided with a stationary abutment.

The object of my invention is to provide means for positively causing the piston-slides to follow the inner periphery of the piston-cylinder. This cannot be accomplished by the action of springs which have been heretofore used for this purpose, though serving the purpose very imperfectly. The faulty action of such springs is due to several causes, one of which is that for each piston-slide a plurality of springs are employed. It being impossible to have all of the springs exert the same pressure upon the piston-slide, the effect is that the slide will be pushed out sooner at one end than at the other when revolving past the abutment, and thus both ends of the piston-slide will bind or press upon the cylinder-heads, and a portion of the fluid will escape between the slide and the cylinder before the slide moves out into full contact therewith. Another evil incident to the use of springs is that they sooner or later become weakened, and when that occurs they will be slow in acting upon the piston-slide, the effect of which is a leakage of the motive fluid between the slide and the cylinder. My improved construction dispenses with such springs, and in order that it may be fully understood reference is made to the accompanying drawings, in which—

Figure 1 is a side elevation of a rotary motor embodying my invention, one of the cylinder-heads being removed. Fig. 2 is a sectional view of the motor complete, taken on line II II of Fig. 1. Fig. 3 is a sectional view taken on line III III of Fig. 2. Fig. 4 is a side elevation of the motor, one cylinder-head, the piston, and shaft being omitted. Fig. 5 is a sectional view of the piston and cams, taken on line V V of Fig. 1.

1 designates the base of the motor, supporting the cylinder 2, which is provided with two ports 3 3 and with two heads 4, secured thereto by screws 5. The inner periphery of the cylinder 2 is circular, and hence easy to make. Fitted within the cylinder, between and intersecting the ports 3, is a crescent-shaped abutment 6, held in position in any suitable manner and preferably detachable from the cylinder, so as to be easily replaced when worn. The ports 3 are led through the forked ends of the abutment 6, as shown at 7.

The rotary shaft 8 extends through a gland 9, packing 10, one head 4, and the cylinder-chamber and is journaled in a socket, as shown, in the opposite cylinder-head 4. Fixed upon the shaft between the heads 4 is a cylindrical piston-body 11, provided with two radial transverse slots, in which the piston-slides 12 are carried. Said slides are capable of radial outward movement and are provided with packing-strips 13, pressed outwardly by springs 14. The lateral faces of the piston-body 11 are provided with annular grooves, in which are loosely fitted packing-rings 11′, which are pressed by springs against the cylinder-heads 4. The abutment 6 is recessed, as shown, and provided therein with a transverse packing-strip 15, pressed toward the shaft 8 by springs 16. (Seen in Fig. 2.)

As shown in Figs. 1 and 5, the piston-body is formed with the concentric recesses 17 in its opposite sides. Projecting into said recesses, respectively, are two heart-shaped cams 18, which are rigidly but detachably secured by screws 19 to the inner faces of the cylinder-heads 4. The configuration of said cams is determined by the paths described by the inner ends of the piston-slides in revolving with their outer ends always in contact with the cylinder 2 or the abutment 6. Hence the inner periphery of the cylinder will have a corresponding circular curved portion 18′ on the cam, and the profile of the abutment 6 will have a correspondingly-curved profile 18″ on the cam, as shown. The radial distances in any direction from the cam-periphery to the inner surface of the cylinder are the same.

The piston-slides 12 are of equal width to that of the piston-body 11 or the wider annular portion thereof, which revolves around the cams 18. As shown in Fig. 1, when one of the piston-slides 12 is at the top it is forced inwardly by the abutment 6, and the cams are correspondingly recessed, as shown at 18″. As the piston-slide continues to re-

volve it is forced outwardly by the increasing radius of the cams, as its inner edge at opposite sides is engaged by the cams, as clearly shown in Fig. 2. As shown in Fig. 1, the inner ends of said slides are rounded for the purpose of reducing friction between themselves and the cam-peripheries.

The operation is obvious. The motive fluid is admitted through either of the ports 3 into the space between the piston-body and the cylinder. The pressure against one or the other piston-slide 12 causes the piston-body and shaft to rotate. As soon as said slide has passed the other port 3 a portion of the fluid exhausts therethrough, and the pressure now acts upon the opposite piston-slide. As the piston-slides revolve they are positively held by the cams 18, with their outer ends almost in contact with either the abutment 6 or the inner surface of the cylinder. Thus all leakage of fluid past the ends of the piston-slides owing to failure of the slides to move out is prevented, as the slide-packings 13 close the narrow slits between the slide ends and the concave surfaces. Also the slides are compelled to move inwardly and outwardly at both ends equally and simultaneously.

I do not wish to be understood as limiting myself to the exact details of construction shown and described, as obvious modifications will occur to persons skilled in the art.

This motor may be driven in either direction according to which of the ports 3 is employed as the induction-port.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In a rotary motor, the combination with a cylinder having a truly cylindrical interior, two tangential ports, the heads, and a crescent-shaped abutment fixed within the cylinder between said ports and having forked ends registering with said ports; of a rotary piston mounted concentrically within the cylinder and having concentric recesses in its ends and radial slots intersecting said recesses, piston-slides in the slots, and heart-shaped cams carried by the heads, standing within said recesses, and serving to operate said slides, the exterior peripheries of the cams being truly parallel with the inner faces of the cylinder and abutment.

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

ALBERT E. STOKER.

Witnesses:
J. MOORE,
LESLIE E. BAIRD.