Jan. 5, 1926. 1,568,429

B. E. TYLER

ROTARY PISTON APPARATUS

Filed Feb. 10, 1925

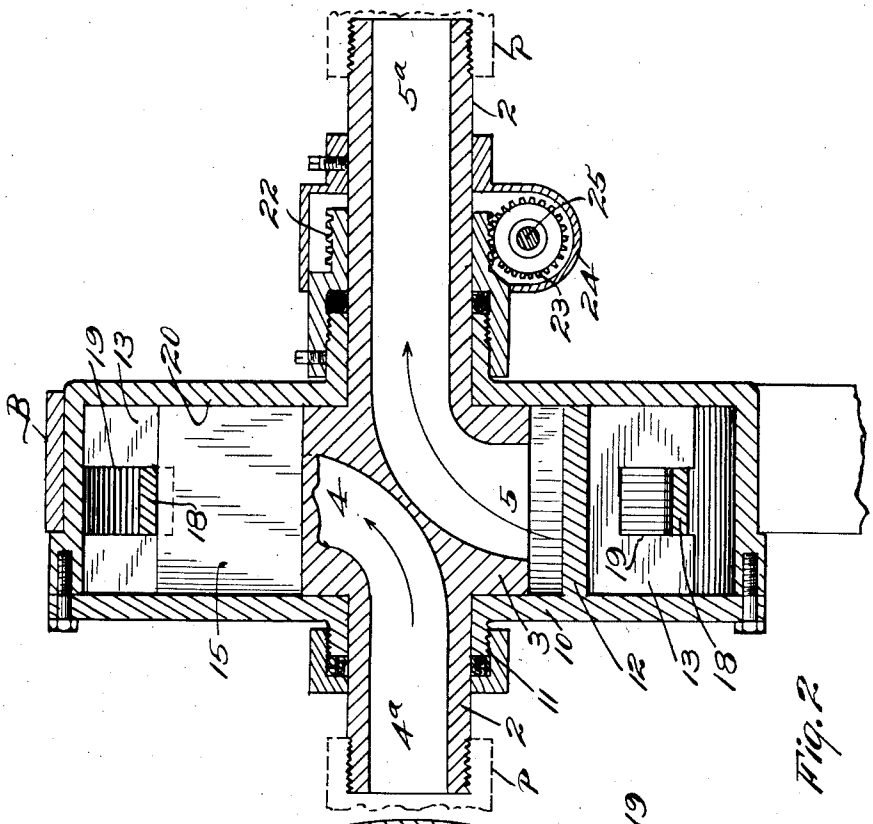


Fig. 2

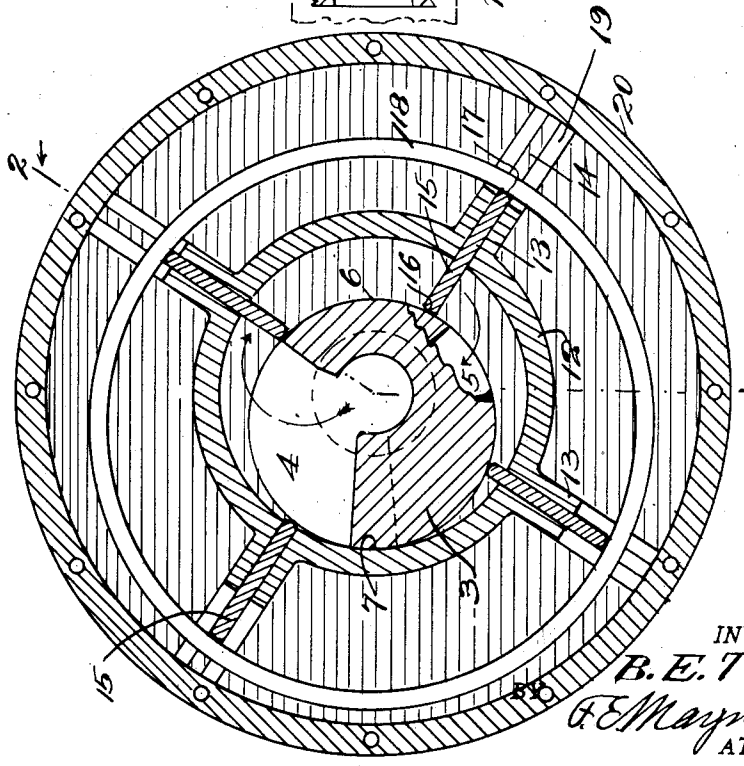


Fig. 1

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ROTARY PISTON APPARATUS.

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To all whom it may concern:

Be it known that I, BERT EBERT TYLER, a citizen of the United States, and resident of South Gate Gardens, Los Angeles County, State of California, have invented new and useful Improvements in Rotary Piston Apparatus, of which the following is a specification.

This invention relates to prime movers and pumps and has for its object to provide a simple, substantial machine which includes a rotary structure and a stationary structure, the relative rotary movement of which may be obtained either by application of pressure fluid, for motor purpose, or by mechanical drive, as for a pump.

An object is to provide a rotary casing carrying sliding piston blades around a stationary eccentric, and to utilize very light weight blades so as to reduce friction, reduce resistance from inertia, and reduce wear and facilitate keeping tight running joints and avoid leakage.

An object is to provide large and direct flow passageways, and to provide an ample lap of piston blades on an intervening surface between pressure and exhaust sides of the machine.

An object is to provide a combined meter and fluid passing machine so that measurement of the fluid may be obtained on a dial or register.

Numerous other objects and advantages will be made manifest in the following specification of apparatus of one embodiment of the invention illustrated here; it being understood that modifications, variations and adaptations may be resorted to within the spirit of the invention and the scope thereof as here claimed.

Figure 1 is a cross-section of the machine.

Figure 2 is an axial section on line 2—2 of Fig. 1.

The invention, in the form shown, comprises a preferably stationary axle 2 designed to be held in any suitable support which may include a line of piping P for fluid for driving, or being driven by, the machine. The axle has a rigid, cylindrical, eccentrically arranged body 3 chambered to form a pressure port 4 to which leads a central passageway 4^a in one end of the axle, and also has, on its opposite side, a discharge port 5 from which leads the exhaust passageway 5^a to the other end of the axle 2. These ports are separated by a long peripheral surface 6 diametrically opposite to a narrow wall end 7.

The ends of the eccentric body 3 are plane and smooth and against one end bears a casing head or disc 10 whose outer face has a packing hub 11 fitting on the axle. On the inner face of the head is provided a rigid cylinder 12 having a suitable number of radial webs 13 forming narrow pockets 14 radial to the center of the cylinder 12, which is concentric to the axle and whose inner surface is of such diameter as to have a close running fit on the distad body wall 7.

Closely but operatively, mounted in each pocket 14, of the carrier cylinder 12, is a blade 15 having rounded inner edge 16 running on and around the eccentric 6, and having an outer, rounded edge 17 engaging a band 18 rotative on the axis of the eccentric and loosely disposed in guideways 19 provided therefor in the webs 13. The carrier cylinder 12 sweeps the blades in an orbit on the center of the eccentric. The band 18 is a retainer to keep the blades to the eccentric and in their orbit thereabout. Any suitable expedient may be resorted to for arrangement of the band in the slots 19 of the webs. For instance, the ring may be of split form with meeting ends secured together.

Operation will therefore be as follows: Running as a motor, pressure fluid will be supplied to port 4 and will thence flow into the space between the contact wall 7 and the proximate blade engaging surface 6, with the result that the pressure will force the exposed blade around toward the exhaust side or port 5. To prevent leakage in this direction, ample length of surface 6 is provided for concurrent lap of two blades or pistons 15. Effort on the pistons is transmitted to the webs and head 10; the webs being enclosed in a casing 20, the periphery of which may form a pulley for a transmission belt B, or it may be of gear form.

No pressure fluid passes beyond the cylinder 12 and the relative movement of the band 18, in the casing, is subject to no more than lubricant friction in the chamber of the casing.

Manifestly, instead of running as a motor, power may be applied by belt B (or other gear) and a fluid as oil or grease, may be forced or flowed through.

To drive a counter, the rotor has a worm

22, in a box 24, driving a gear 23, secured on a spindle 25.

What is claimed is:

1. A machine of the class described having a casing and its head, a concentric axle for the casing and an eccentric, cylindrical, rigid body on the axle and fitting between the casing and its head, a cylinder rigid with the casing and having contact with one side of the said body and being concentric with the axle, a system of pocketed webs rigid with the cylinder and having sliding piston blades radial to the axle and engaging the eccentric, and a blade retaining band on the outer edges of the blades.

2. A machine of the class described having a casing and its head, a concentric axle for the casing having an eccentric body thereon fitting between the ends of the casing, a cylinder rigid with the casing and engaging one side of the said body and being concentric with the axle, a system of webs radial to the axle and rigid with the cylinder and carrying slidable blades engaging the said body, and a blade retaining band on the outer edges of the blades; the webs being slotted to receive the said band.

3. A machine of the class described including a fixed axle having an eccentric, cylindrical body and having an inlet in one end and an outlet in the other, said body having opposite ports separated by a wide lap surface, a cylinder concentric to the axle and having running contact with the distad side of the said body and having radial guides, a system of equispaced piston-blades carried by said guides and radial of the cylinder, a retaining band holding the blades against the said body while the cylinder rotates thereabout, and a casing fixed to the cylinder and forming a housing for the cylinder and band.

4. A machine of the class described including an axle having an eccentric, cylindrical body and having inlet and outlet ports to said body, a cylinder concentric to the axle and having running contact with the distad side of said body, a system of equispaced piston blades carried by and radial of the cylinder, a band holding the blades against the said body while the cylinder rotates, and a casing rigid with the cylinder and enclosing the parts; the cylinder being provided with radial webs enclosing the blades slidably and having slots in which the band lies against lateral play on the outer edges of the blades.

5. A machine comprising an axle, a head and a cylindrical casing rotative on the axle, an eccentric on the axle, radial webs fixed to the head and a cylinder from which the webs extend to the casing, a floating band lying between the casing and the cylinder, and blades engaging the eccentric and sliding in the webs and holding the band concentric to the eccentric; said cylinder contacting with one side of the eccentric.

6. A machine of the class described having a casing with a cylindrical chamber, an axle concentric to the chamber and having an eccentric body fitting between end walls of the casing, a cylinder concentric with the axle and fixed in the casing and having running contact with the said body, a system of blades radial to the axle and slidably mounted in the said cylinder and engaging said body, and a floating band, around the cylinder, supported by the blades and holding them in place against the body.

BERT E. TYLER.