

A. PETERSON.
 ROTARY MOTOR.
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1,026,120.

Patented May 14, 1912.

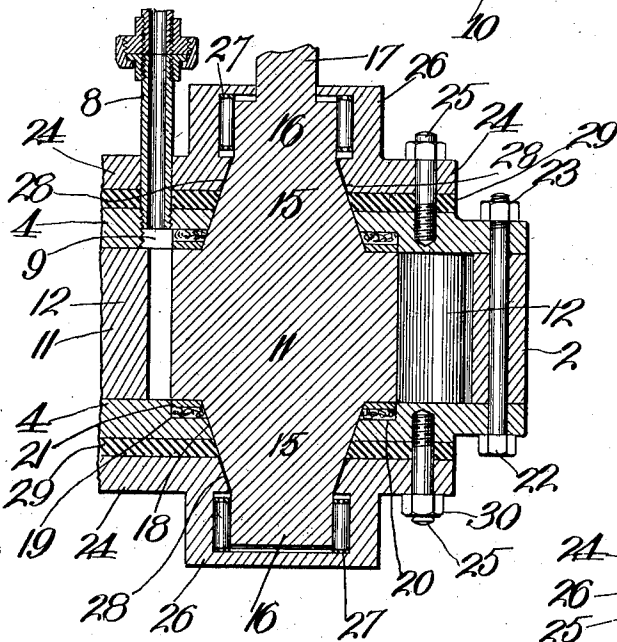
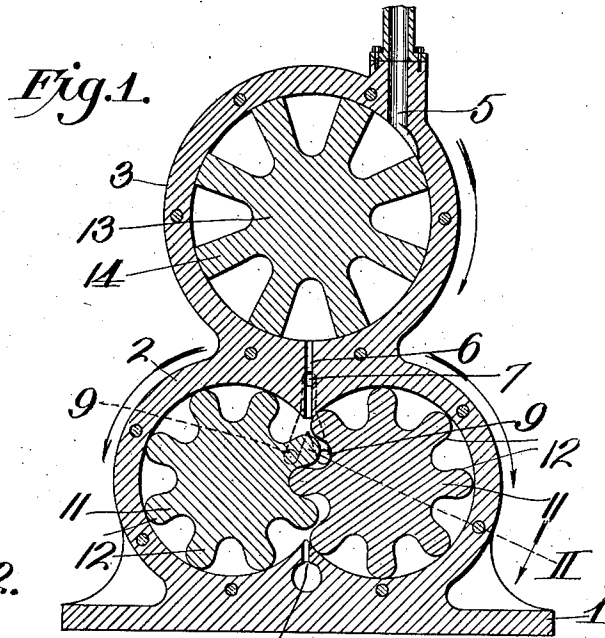
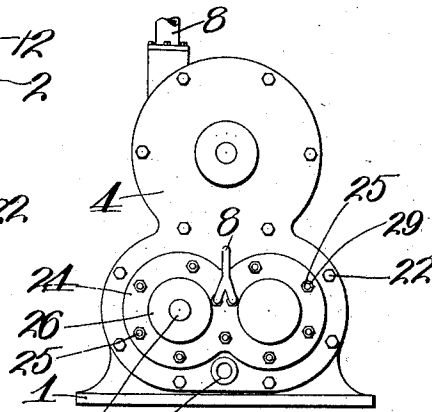


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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ROTARY MOTOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALFRED PETERSON, a citizen of the United States, residing at Independence, 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.

This invention relates to rotary motors and has for its primary object to produce a rotary feed valve for opening and closing communication between a steam-supply and the cylinder of the engine, for the purpose of utilizing pressure derived from expansion in the operation of the pistons in the cylinder.

With this general object in view and others, as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings in which—

Figure 1, is a central vertical section of a rotary motor embodying my invention. Fig. 2, is an enlarged section on the dotted line II of Fig. 1. Fig. 3, is a side view of the motor.

Before proceeding with the detailed description it is desired to state that this invention is designed more particularly as an improvement in the rotary motor upon which Patent #926,846, was issued to A. Brauer, July 6, 1909, which motor is designed to operate only under direct pressure of steam.

In the said drawing, 1 indicates the base and 2 the cylinder of the engine, the cylinder consisting of two oppositely bowed and communicating members, and 3 is a cylinder bearing a superposed relation to the members of cylinder 2, and 4 indicates the end-plates or heads of the two cylinders.

5 is a steam supply port for cylinder 3, and 6 a port connecting said cylinder with the cylinder 2, in the vertical plane of the axis of the cylinder 3.

7 is a port communicating with port 6 and connected by a Y-shaped by-pass 8 with a port or ports 9 in one of the heads of cylinder 2, the ports 9 being disposed in a horizontal plane between the lower end of port 6 and the horizontal center of the cylinder 2, and near and at opposite sides of the vertical plane of said port 6, and vertically

below said port the cylinder 2 is provided with an exhaust port 10.

11 indicates a pair of pistons which are provided peripherally with longitudinally extending teeth or blades 12 for intermeshing action as in the patent hereinbefore mentioned, the pistons being so proportioned that each is in fluid tight engagement with the circumferential wall of its respective end of cylinder 2, and projects slightly into the other end of the cylinder, that is to say projects slightly beyond the vertical plane of ports 6 and 10, the pistons being also so formed that they always maintain a fluid tight connection between the said ports, so that steam entering the cylinder through ports 6 can not pass between the pistons to port 10. The pistons are also so proportioned that as a tooth or blade of one starts to withdraw from between adjacent teeth or blades of the other, a slight chamber is provided and at such time the pistons are in such position that such chamber if in the left-hand piston will be in communication with the left-hand port 9 and if in the right hand piston will be in communication with the right hand port 9, as shown clearly in Fig. 1. By this arrangement steam passing through the by-pass and into the chamber in communication with one of said ports 9 exerts pressure radially on one of the pistons and thus utilizes the same as an abutment for imparting rotation to the other piston and at the same time steam from port 6 enters the space between the last-named blade or tooth and the blade or tooth in advance thereof on the same piston, and exerts pressure on the blade or tooth of the other piston next in advance of said chamber receiving the steam from the by-pass.

13 is a rotary valve provided with a plurality of equi-spaced blades 14, journaled in cylinder 3 so that the impact of steam under pressure from the supply port 5 shall impart rotation to the valve in the direction indicated by the adjacent arrow, Fig. 1, each blade of the valve closing the mouth of port 6 as it passes the same for the purpose of giving the steam which has been fed from the chamber between said blade and the preceding blade through port 6, and the by-pass into cylinder 2, an opportunity to expand and thus utilize force thus derived as well as force derived by the direct pressure of the steam in operating the piston

of cylinder 2, it being obvious that by utilizing expansive force of the steam, an economy of operation results.

Each piston and the valve is diametrically reduced to form outwardly tapering cones 15 provided with cylindrical ends 16, and at one end with shaft extensions 17 upon which a power transmitting wheel (not shown) is adapted to be mounted, and the heads 4 are provided with tapered openings 18 fitting snugly on the cones 15, and said heads are provided at their inner sides with recesses 19, containing an oil packing 20 and wear-rings 21, the latter being interposed between the packing and the ends of the body portions of the pistons or valve as the case may be, and adapted to prevent steam from blowing out the oil packings, the bolts 22 and nuts 23 securing the heads to the body of the cylinders, serving to clamp the packings tightly between the heads and said rings and upon the conical portions 15, ordinary cups (not shown) being arranged to supply lubricant to the oiling packings. 24 are caps fitting on stud bolts 25 projecting outward from the heads, and provided with hollow heads 26, receiving the cylindrical portions 16 and containing roller bearings 27 interposed between the peripheries of said portions and the circumferential portions of the hollow heads. The caps are provided with tapered openings 28 through which the conical portions 15 project and interposed between the caps are fiber packings 29 fitting snugly on the tapered portions 15, nuts 30 engaging the outer ends of the stud bolts for the purpose of clamping the caps and the fiber packings 29 firmly against the heads with an oil tight relation.

Power may be transmitted from each shaft extension of the pistons, and if desired said pistons may be connected by gearing (not shown) to relieve the intermeshing pistons of undue wear. The valve may be driven independently or may be geared to the pistons and in operation will supply as many charges of steam to the cylinder 2 as there are pockets or chambers in the valve, it being preferred that each pocket or chamber shall have a capacity greater than that of the port 6, the by-pass 8, and the space within the cylinder 2 with which said port and by-pass communicate so as to obtain the greatest possible benefit from the expansion of the steam in the cylinder, and in this connection it will be apparent that after each charge of steam enters the cylinder a blade of the valve closes the upper end of port 6 to give such charge in the cylinder an opportunity to expand before the supply in the cylinder is augmented by communication with the following pocket or chamber of the valve. It will also be noted that the valve (not shown) control-

ling the exhaust port, may be utilized to regulate the speed of the pistons or to arrest the same and that because of the communication between cylinder 2, and the valve cylinder, a retardation of the speed of the pistons will reduce the speed of the valve and that the arrest of the pistons by cutting off the said exhaust will instantly arrest the valve because the steam will be unable to escape from the pockets thereof and will therefore be at boiler pressure. It will be understood of course that the supply port 5 must be of somewhat greater area than the width of one of the blades of the valve so that the steam supply can not be cut off by the closing of said port by one of the blades as otherwise it will be impracticable to start the motor in operation, especially if it was used on a locomotive where the valve could not be rotated by hand.

From the above description it will be apparent that I have produced a rotary motor embodying the features of advantage enumerated as desirable in the statement of invention and I wish it to be understood that while I have illustrated and described the preferred embodiment of the invention I do not desire to be restricted to the exact details of construction and organization shown and described as obvious modifications will suggest themselves to one skilled in the art.

I claim:

1. A rotary motor comprising a cylinder, a pair of toothed rotary pistons in said cylinder and intermeshing with each other, a valve cylinder, a port connecting the valve cylinder with the piston cylinder, a supply port communicating with the valve cylinder, an exhaust port leading from the piston cylinder, and a multiple bladed valve within the valve cylinder and adapted to be driven by fluid supplied thereto through said supply port and to alternately open and close the port leading from the valve cylinder to the piston.

2. A rotary motor, comprising a cylinder, a pair of toothed rotary pistons in said cylinder and intermeshing with each other, a valve cylinder, a port connecting the valve cylinder with the piston cylinder, a supply port communicating with the valve cylinder, an exhaust port leading from the piston cylinder, a multiple bladed valve within the valve cylinder and adapted to be driven by fluid supplied thereto through said supply port and to alternately open and close the port leading from the valve to the piston, and a branched by-pass leading from the last-named port in the piston cylinder at opposite sides of the vertical plane of the port from which the by-pass leads, the branches of said by-pass being adapted to alternately supply steam to the pistons be-

tween a pair of the blades of one of the pistons and the blade of the other piston which at said time is fitting between said pair of blades.

5 3. In a rotary motor, a cylinder, a rotary element therein provided with outwardly tapering axial cones having cylindrical portions at the reduced ends of the cones, one of said cylindrical portions having a shaft extension; the heads of the cylinder having tapered openings receiving said cones and recesses, rings fitting in said recesses and around said cones and against the adjacent ends of the rotary element, and oiling packings fitting in said recesses between said heads and said rings and around said cones.

10 4. In a rotary motor, a cylinder, a rotary element therein provided with outwardly tapering axial cones having cylindrical portions at the reduced ends of the cones, one of said cylindrical portions having a shaft extension; the heads of the cylinder having

tapered openings receiving said cones and recesses, rings fitting in said recesses and around said cones and against the adjacent ends of the rotary element, oiling packings fitting in said recesses between said heads and said rings and around said cones, caps secured to the heads and fitting around said cones and provided with hollow heads inclosing the cylindrical portions at the reduced ends of the cones, bearings in said heads and engaging the periphery of the said cylindrical portions, packing plates interposed between said caps and said heads and around said cones, and means to clamp said packing plates firmly between the caps and said heads and upon said cones.

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

ALFRED PETERSON.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."