No. 893,485. PATENTED JULY 14, 1908.

J. GRINDROD.

ROTARY MACHINE.

APPLICATION FILED JUNE 25, 1906.

Fig 1

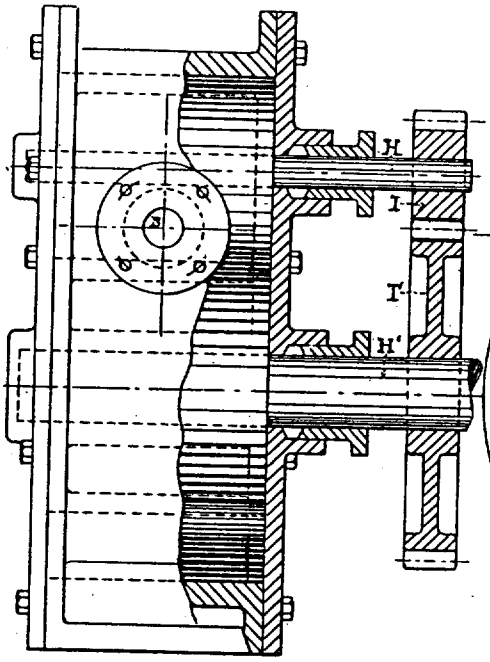
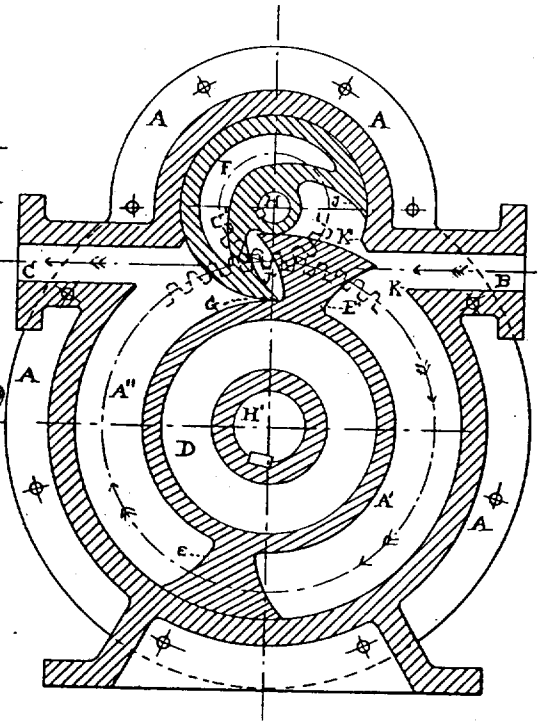


Fig 2



Edwin L. Foster.

Lewis Morris.

Witnesses.

John Grindrod

Inventor

UNITED STATES PATENT OFFICE.

JOHN GRINDROD, OF BAKERSFIELD, CALIFORNIA.

ROTARY MACHINE.

No. 893,485. Specification of Letters Patent. Patented July 14, 1908.

Application filed June 25, 1906. Serial No. 323,276.

To all whom it may concern:

Be it known that I, JOHN GRINDROD, a citizen of the United States, residing at Bakersfield, in the county of Kern, State of California, have invented new and useful Improvements in Rotary Machines, of which the following is a specification.

This invention relates to a rotary machine which is applicable either as a pump or as a motor or engine, and to that class wherein a rotary piston member is arranged within a chamber and coöperates with another member, the abutment or valve member, to act on the fluid or to be acted on thereby, in the operation of the pump or motor.

The main object of the present invention is to provide a device of this character of great simplicity and efficiency.

A further object of this invention is to provide in a device of this character, means for preventing leakage of the fluid between the piston member and the abutment or valve member, and at the same time reduce the friction to a minimum.

In the accompanying drawings: Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is a transverse section.

The outside casing A is formed with chamber A′, an inlet B and an outlet C. The inlet and outlet are preferably arranged upon opposite sides of the chamber and in the same horizontal plane, as shown in the drawing, so as to allow the ready escape from the chamber of any heavy sand, gravel or other matter drawn into the chamber when the device is used as a pump. Within this pump is arranged a piston member D mounted on a shaft H′ journaled in bearings on the outside casing A, said piston member having two pistons E, E′ each of which is formed on its outer face as an arc or cylinder concentric to the axis of the piston member. The piston is concavely undercut or tapers inwardly in a concave curve from such outer face to the cylindrical surface of the hub portion of the piston member D, and a pocket *e* is also preferably provided in such undercut portion. The casing A also has a recess formed as a portion of a cylinder and opening into the chamber A′, said recess being adapted to receive and fit the combined abutment and valve F mounted on shaft H which is journaled in bearings on the casing A. This abutment and valve member is formed as considerably more than one-half of a cylinder, being broken away at only one side to connect with the passage on the piston *g*. The wall or portion of the member F at each side of said broken away part is concavely undercut or inclined backward from a radial direction and is provided with a pocket *f*. The undercutting of the two members E or E′ is such that the cylindrical portion of member F begins to roll on the cylindrical portion of member D while the cylindrical portion of member E or E′ is still rolling on the cylindrical hub portion of member F. To effect this it is necessary that the undercutting of member E or E′ should extend clear to the cylindrical body of member D, in other words, that the base of member E or E′ should be narrower than the outer face thereof. Such undercut portions terminate at their inner ends in a hub portion I which is formed as an arc of a cylinder and is adapted to roll on the outer cylindrical-arc surface of the pistons. Similarly, the piston D is provided with a hub portion *d* which is extended between the inner ends of the piston and formed as arcs of cylinders concentric with the axis of rotation, said cylinder surfaces *d* rolling on the cylindrical periphery of the member F. By this means a double joint is obtained to prevent leakage of fluid between the parts, one joint being between the outer end of the piston and the cylindrical hub portion of member F, and the other joint being between periphery of member F and the cylindrical hub portion of member D. Both of these joints are rolling joints so that friction is reduced to a minimum, and as the fluid has to pass through both of them in succession before it can pass from the high pressure to the low pressure side of the machine, the leakage is also reduced to a minimum. Each piston being formed with a cylindrical arc shaped outer end to fit and slide within the outer cylindrical wall of chamber A′, it follows that there will be no material leakage around the outer end thereof, and as the member F fits within the cylindrical recess A, it is apparent there can be no material leakage around the periphery of said member.

In the operation of the apparatus, used, for example, as a pump, the rotation of the piston member, in the direction of the arrow, causes the fluid to flow into inlet B and through outlet C. As each piston enters into the recess of the abutment and valve member and engages at both faces, the said mem-

ber pockets a portion of the fluid between the undercut walls of the piston and valve member, and to avoid any knocking or hammering, due to compression of the fluid, in such case, pockets *e* and *f* are provided, which during the time that the piston member is closing into the recess in the member F, enables passage of the fluid from this pocketed space.

What I claim is:—

1. A rotary machine comprising a casing having a cylindrical chamber and a recess opening therefrom and formed as a portion of the cylinder, a piston member having a cylindrical hub portion and mounted to rotate in the cylindrical chamber and carrying two pistons, said pistons being formed as arcs of cylinders on their outer ends and having undercut portions extending inwardly from said outer ends to the cylindrical hub portion of the piston member, the base of said piston being narrower than the outer face thereof, and an abutment member mounted to rotate in the said recess and formed as a portion of the cylinder fitting in said recess, said abutment member having a recessed portion, the walls of which are undercut from a radial direction and are connected by a hub portion formed as an arc of a cylinder, said hub portion being adapted to roll on the outer ends on the pistons and the periphery of said abutment member being adapted to roll on the aforesaid hub portion of the piston member.

2. A rotary machine comprising a casing having a cylindrical chamber and a recess opening therefrom and formed as a portion of the cylinder, a piston member having a cylindrical hub portion and mounted to rotate in the cylindrical chamber and carrying two pistons, said pistons being formed as arcs of cylinders on their outer ends and having concavely undercut portions extending inwardly from said outer ends to the cylindrical hub portion of the piston member, the base of said piston being narrower than the outer face thereof and an abutment member mounted to rotate in the said recess and formed as a portion of the cylinder fitting in said recess, said abutment member having a recessed portion, the walls of which are concavely undercut from a radial direction and are connected by a hub portion formed as an arc of a cylinder, said hub portion being adapted to roll on the outer ends on the pistons and the periphery of said abutment member being adapted to roll on the aforesaid hub portion of the piston member.

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

JOHN GRINDROD.

Witnesses:

EDWIN L. FOSTER,

LEWIS MORRIS.