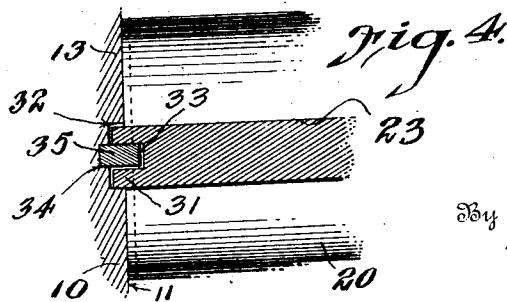
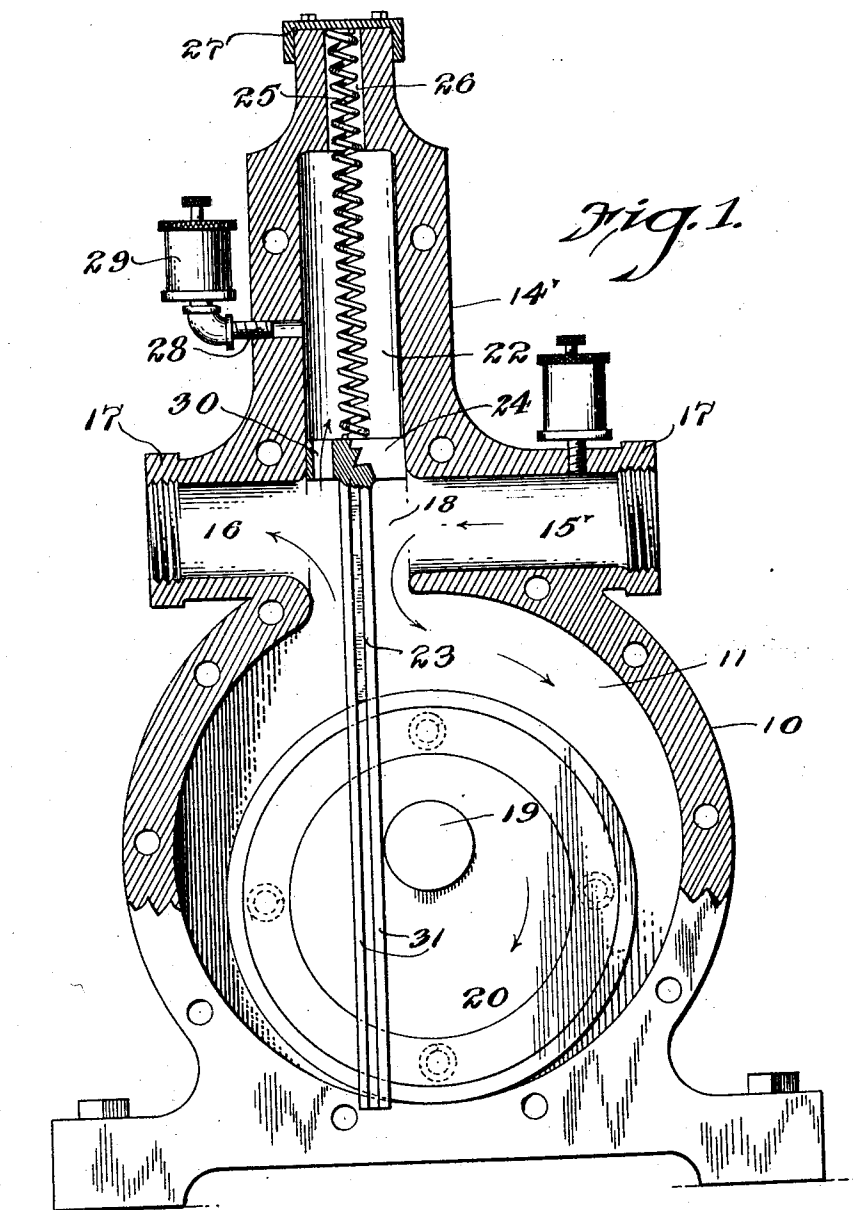


F. MARION.
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 APPLICATION FILED MAR. 22, 1920.

1,409,054.

Patented Mar. 7, 1922.
 2 SHEETS—SHEET 1.



Inventor
 Frank Marion,

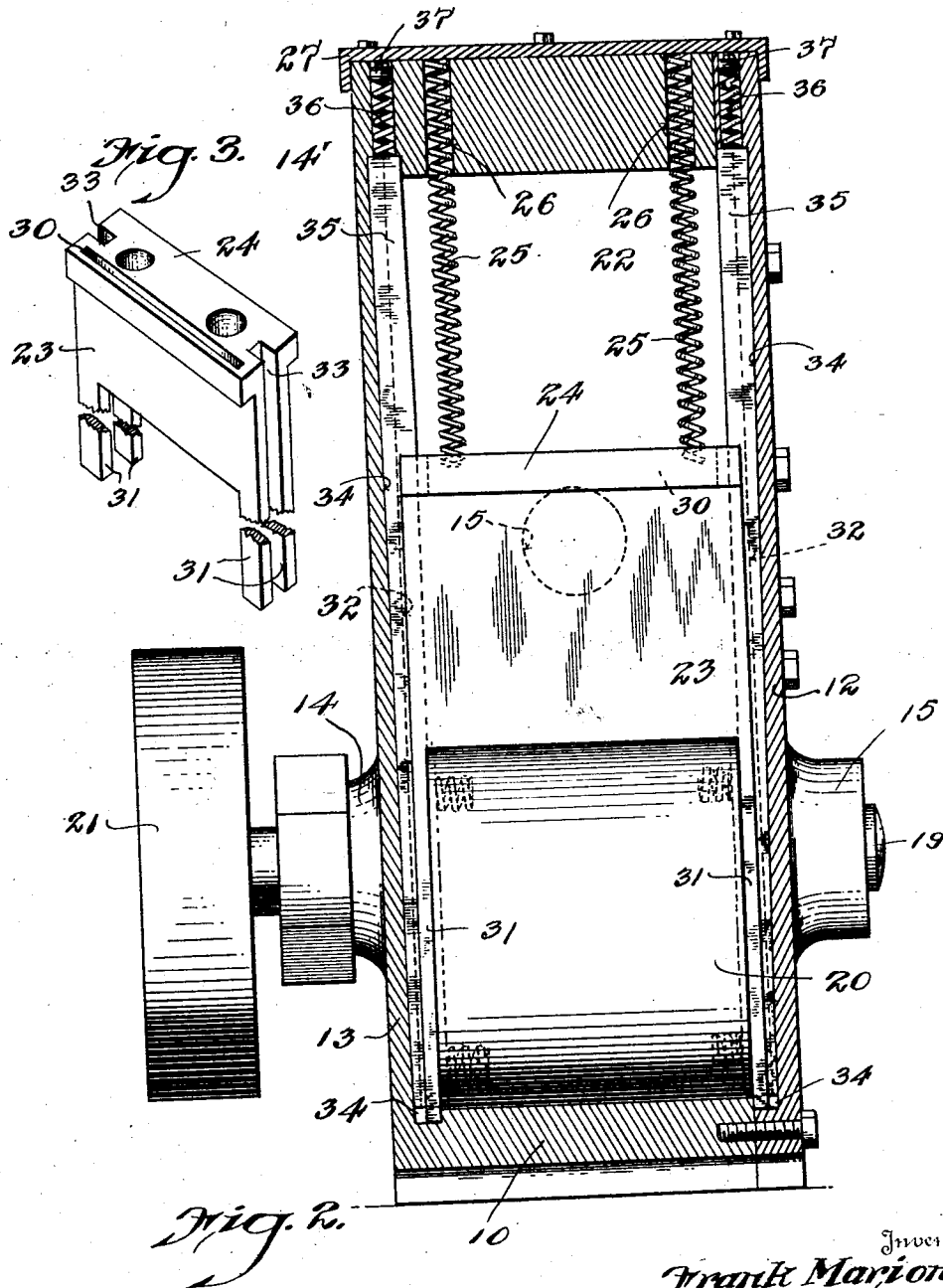
By H. Woodward
 Attorney

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 Attorney

UNITED STATES PATENT OFFICE.

FRANK MARION, OF HARDWICK, VERMONT, ASSIGNOR TO MARION ROTARY MOTORS COMPANY, INC., OF HARDWICK, VERMONT, A CORPORATION OF VERMONT.

ROTARY PUMP CASING AND ABUTMENT CONSTRUCTION.

1,409,054.

Specification of Letters Patent.

Patented Mar. 7, 1922.

Application filed March 22, 1920. Serial No. 367,789.

To all whom it may concern:

Be it known that I, FRANK MARION, a citizen of the United States, residing at Hardwick, in the county of Caledonia and State of Vermont, have invented certain new and useful Improvements in Rotary Pump Casing and Abutment Constructions, of which the following is a specification.

The invention has for an object to effect improvements in rotary pumps, and particularly aims to simplify the casing and abutment construction. It is a particular object to bring the inlet and outlet ports as closely together as possible with the invention of the least possible solid elements which would tend to impede the flow of liquids or limit the action of the pump. A further aim is to give a pump-casing construction adapted to be readily-cast in one piece at a low cost.

A further aim is to improve the abutment construction and its mounting in the casing so that proper engagement of the abutment with a cam piston will be assured without excess friction or waste of power. A further aim is to enable the provision of a device in which the abutment will be securely borne against the piston at the discharge side of the pump by reason of the pressure therein, whereby the pressure of the abutment will be proportional to that in the discharge pipe.

Additional objects, advantages and features of invention will appear from the construction, arrangement and combination of parts hereinafter described and shown in the drawings, wherein,

Figure 1 is a vertical sectional view of the pump constructed in accordance with my invention,

Fig. 2 is a cross sectional view thereof,

Fig. 3 is a detail of the abutment member with parts broken away,

Fig. 4 is a fragmentary horizontal cross section of the abutment and adjacent casing part.

There is illustrated a pump comprising a casing portion including a body casting 10 having a cylindrical chamber 11 therein closed by a cover plate 12, the casting 10 including a back plate portion 13 provided with a bearing 14 therein alined with a similar bearing 15 on the plate 12. The body casting is formed with a vertical extension 14' at the base of which inlet and outlet passages 15' and 16 are formed co-axially, having at their outer ends terminal tapped extensions 17 with which pipe connections may be readily made. A port 18 is formed opening from the chamber 11 centrally beneath the extension 14' offset beyond the vertical center of the device in the direction of the outlet passage 16. A shaft 19 is mounted in the bearings 14 and 15 upon which shaft a cam piston 20 is secured, the shaft extending a distance beyond the casing at one side and having a pulley 21 mounted thereon. In the vertical extension 14' there is formed a vertical guide passage 22, alined with the port 18, the passage being smoothly finished and having slidably engaged therein an abutment member 23 in the form of a plate of a thickness much less than the circumferential width of the port 18 so that the plate may extend slidably therethrough leaving a clearance on each side sufficient to provide for ingress and egress of liquid during the operation of the pump from and to the passages 15' and 16 respectively. The plate is formed with a head portion 24 snugly fitted in the passage 22, which is somewhat larger than the cross sectional measurement of the plate 23, and in the present instance being snugly engaged against the surfaces of the passage 22 which is coincident in size with the port 18. A spring 25 bears upon the upper side of the head 24 at each side, these springs being engaged through reduced bores 26 formed through the upper outer part of the extension 14' and closed by a cap 27, by which means the springs are suitably confined. Opening from the passage 22 from one side there is an oil duct 28 in communication with an oil cup 29. The head portion 24 in this construction projects on opposite sides of the abutment, and on the side next the outlet 16 is formed with an aperture 30 forming communication between the outlet passage 16 or compression side of the pump and the passage 22, at that side only. The plate portion of the abutment is also provided with downward extensions 31, two at each side, receiving the piston 20 snugly therebetween, and engaged in suitable grooves 32 formed in the plates 12 and 13 of the casing. A groove 33 is formed on each edge of the abutment plate the bottom of which is in a plane with the inner faces of the extensions 31. Grooves of similar width to the grooves 33 are formed intermedi-

ately of the grooves 32 in the plates 12 and 13, and numbered 34, these last named grooves having bottom portions sloped inwardly from their upper parts to their lower parts, and slidably engaged in the grooves 33 and 34, there are wedge-shaped packing bars 35, having their inner sides disposed in a vertical plane alined with the adjacent inner surfaces of the plates 12 and 13, and adapted to permit free sliding movement of the abutment, and rotation of the piston, while engaging snugly against the sides of the piston, extending as close as possible to or beyond the bottom of the chamber 11, so as to close off the inlet side from the outlet side of the pump. The extensions 31 extend downwardly to one side of the shaft 19, the packing devices 35 may extend the full height of the chamber 11 without interference or complication with the shaft of the piston. Suitable springs 36 bear upon the upper ends of the bars 35, being adjustable by means of suitable screws 37 engaged through the upper part of the body casting.

25 In operation, in the initial movement of the pump before appreciable pressure has been developed in the passage 16, the springs 25 will serve to hold the abutment in proper engagement with the piston. At this time, in case there is much suction involved, atmospheric pressure upon the head 24 will also aid in maintaining the abutment properly seated, so that but little force is required to be exerted by the springs 25 and therefore the friction due to the action of these springs will be but slight. The pressure induced by suction and subsequently by rising pressure in the outlet 16 will promote the efficiency of the device in preventing escape of liquid under the abutment from the outlet to the inlet side when the device is in operation, it being understood that this tendency is greater when the pressure is high than when it is low, so that less pressure would be required on the abutment where low pressures are involved. By the action of liquid in the outlet 16 operating through the opening 30 upon the upper side of the head 24, the device will automatically proportion the pressure upon the abutment to suit the service to which the pump is applied.

The pressure at the outlet side of the pump will also bear the abutment toward the inlet side, causing it to engage the sides of the groove 32, and when that is worn, the bars 35, which will also be borne against the sides of the tapered grooves 34. As the bars 35 become worn by friction of the abutment and of the piston 20, they will automatically slide inwardly by the action of the springs, maintaining a water-tight joint at all times. The bars 35 preferably project into recesses in the casting 10 below the chamber 11, but various modifications

of the constructions may be followed as found desirable.

What is claimed:

1. A pump comprising a casing having a circular chamber therein and a cam piston mounted revolvably in the chamber, a shaft carrying the piston coaxially of the chamber and projected through the side of the casing, and the casing having an extension, offset from a parallel line through the axis of the shaft toward the outlet side of the pump, a guide passage being formed therein and an alined port communicating with the chamber, inlet and outlet passages opening toward each other immediately outward of the port and in communication therewith, said casing being formed with terminal pipe receiving parts at the passages, an abutment element snugly slidable between opposite sides of the chamber including a plate portion medially disposed in said port and a head portion snugly engaged in said passage, whereby a division is formed between the inlet and outlet passages, said head portion being apertured on the outlet side, and a wedge-shaped packing member mounted in opposite sides of the casing having parallel sides exposed therein and engaging snugly the piston and abutment.

2. In a device of the character described, a casing comprising a circular chamber having parallel sides, a concentric shaft thereacross, an eccentric cam piston on the shaft, a port formed in the casing opening from said chamber, said casing having a guide extension outwardly from and in line with the port, inlet and outlet passages formed in the casing opening into opposite sides of the port, an abutment member including a plate portion intermediately disposed in the port and having a head portion slidably engaged in said extension, the head portion being projected a distance over said port at the inlet side, communication being formed in the device between the compression side of the chamber and the outer side of said head, for the purposes described.

3. In a device of the character described the combination of a casing having a piston chamber, a piston revolvable therein, a shaft carrying the piston, an abutment slidably engaged with the piston and slidably mounted in the casing, and a packing device at each side including a wedge-shaped member both being located in a plane parallel to and offset from the shaft slidable to compensate for wear, engaging snugly against said piston and abutment and means to adjust the wedge-shaped members.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANK MARION.

Witnesses:

FRED L. LAIRD,
MARY G. NYE.