G. W. KELLER & E. C. GOETZ.

ROTARY PUMP.

APPLICATION FILED NOV. 19, 1909.

960,339.

Patented June 7, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

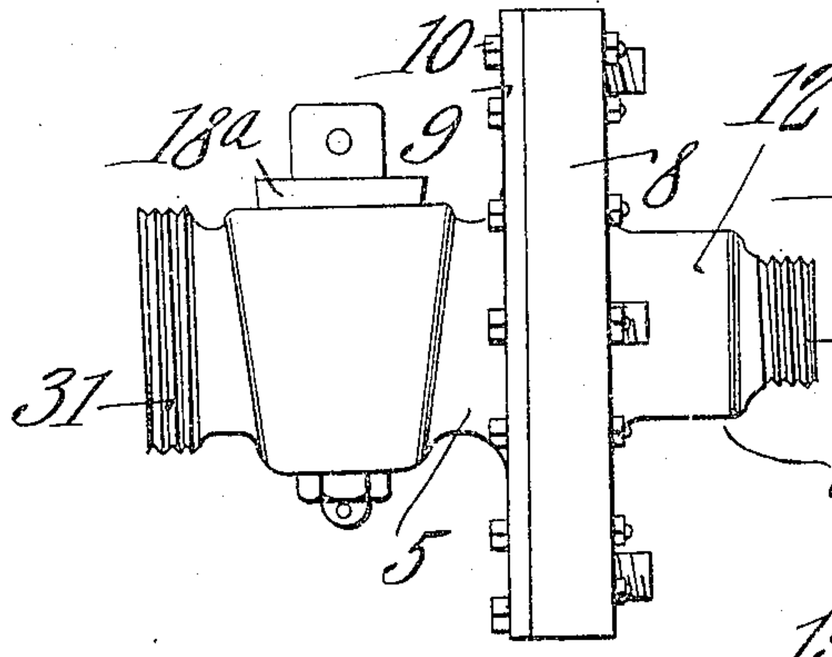
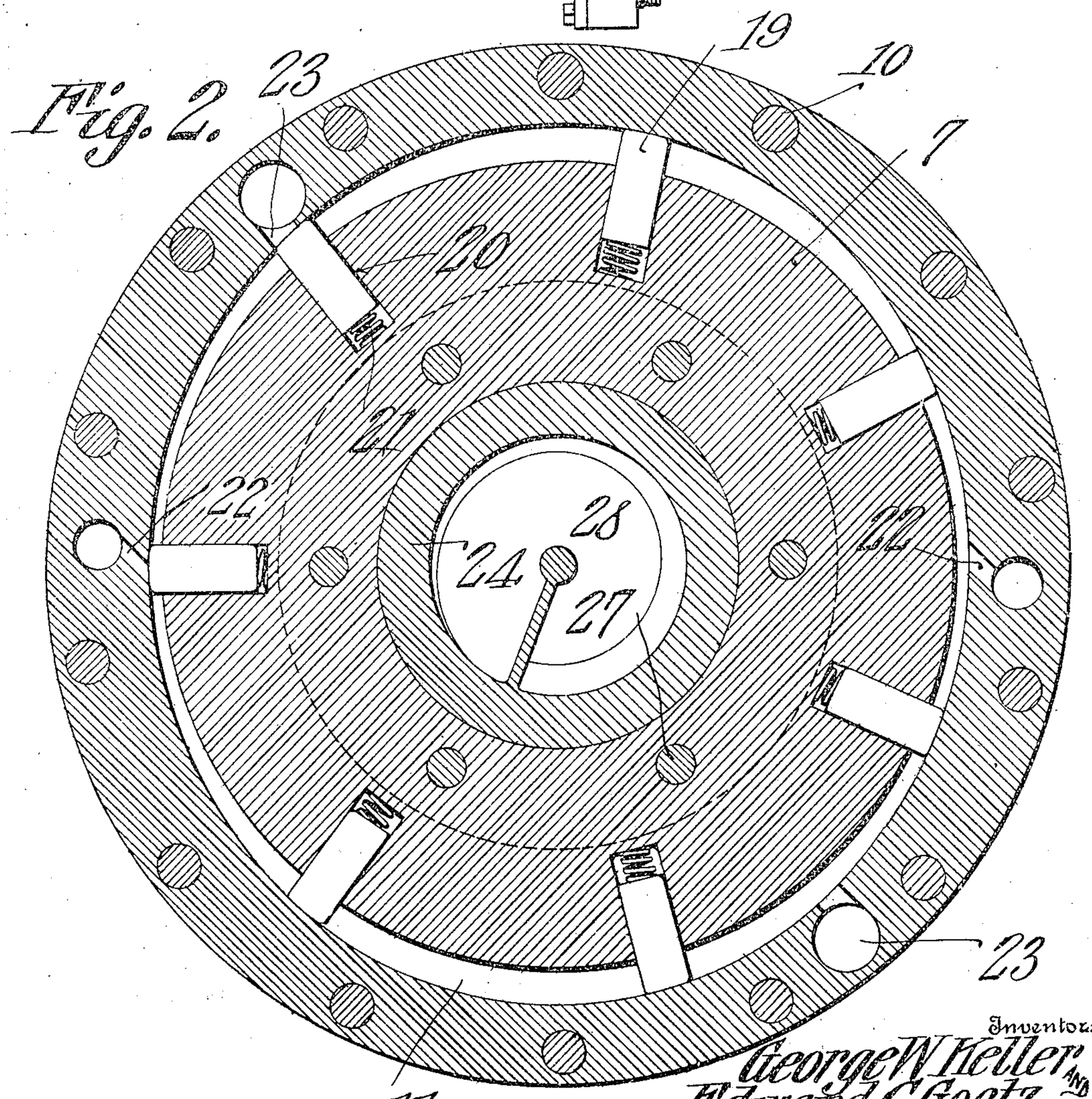


Fig. 2.



Witnesses

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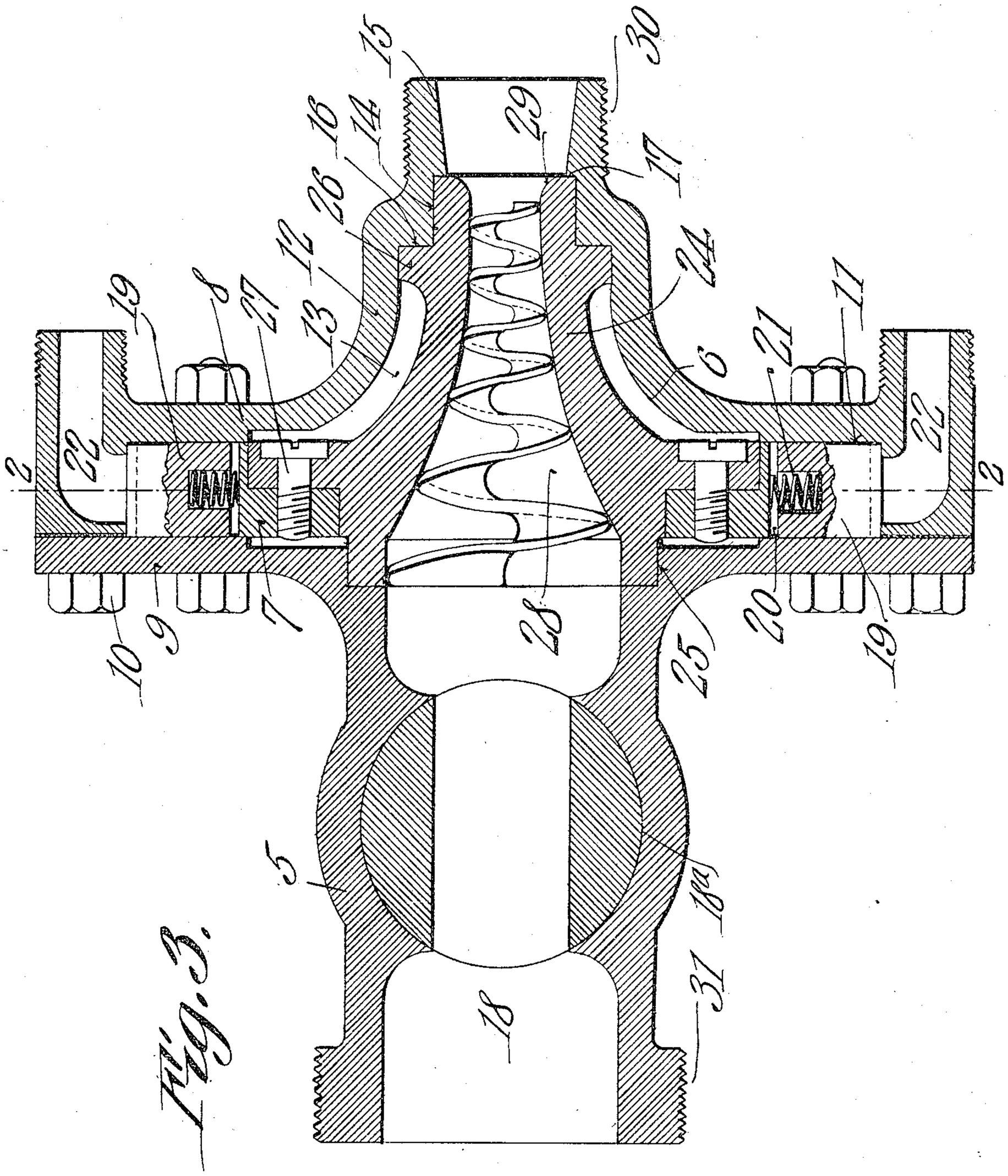

Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE W. KELLER AND EDWARD C. GOETZ, OF PORTSMOUTH, OHIO.

ROTARY PUMP.

960,339. Specification of Letters Patent. Patented June 7, 1910.

Application filed November 19, 1909. Serial No. 528,923.

To all whom it may concern:

Be it known that we, GEORGE W. KELLER and EDWARD C. GOETZ, citizens of the United States, residing at Portsmouth, in the county of Scioto, State of Ohio, have invented a new and useful Rotary Pump, of which the following is a specification.

This invention relates to rotary pumps in which the pump piston is in the shape of a screw, and it is the object of the invention to provide a piston of this kind embodying certain novel structural details to be hereinafter described and claimed.

The invention also has for its object to provide improved means for driving the piston, the latter being so constructed as to form the piston of a rotary motor, and said piston being provided with radial wings which receive the impact of a fluid pressure for driving the piston.

The invention is illustrated in the accompanying drawing forming a part of this specification, in which drawings—

Figure 1 is an elevation of the pump. Fig. 2 is a vertical section on the line 2—2 of Fig. 3. Fig. 3 is a central longitudinal section of the pump.

Referring to the drawings, the pump casing is shown in two sections, indicated at 5 and 6 respectively. The contiguous ends of the casing sections are shaped to form a cylinder in which the rotary piston 7 works. The cylinder is had by forming the contiguous ends of the casing sections with circular flanges 8 and 9 respectively, and said flanges have registering apertures to receive bolts 10 whereby the two sections are rigidly fastened together. The inner face of the flange 8 has a recess 11 forming the interior of the cylinder in which the aforesaid rotary piston works.

From the outer face of the flange 8 projects a hollow boss 12, the bore 13 of which is in communication with the recess 11, said bore tapering from the recess, and terminating in two reduced portions 14 and 15, respectively, the first-mentioned reduced portion forming a shoulder 16, and the last-mentioned a shoulder 17. The reduced portion 15 of the bore is flared, and forms the outlet of the pump. Extending lengthwise through the casing section 5 is a passage 18 which is the pump inlet, and working transversely in this passage is a turning plug 18ª for controlling the flow therethrough.

The piston 7 is a ring having a steam tight fit between the flanges 8 and 9 forming the cylinder head, and spaced at its periphery from the cylinder wall, said wall being slightly elliptical in outline. The piston carries radially extending wings 19 slidably mounted in recesses 20 made in the periphery of the piston, and held in constant contact with the cylinder wall by springs 21 mounted in the recesses behind the wings. The interior of the cylinder is entered by two diametrically opposite inlet ports 22 extending obliquely to the radius of the cylinder so as to discharge the steam with a jet action against the wings 19. These ports open through the cylinder head 8. The exhaust ports 23 are located midway between the inlet ports, diametrically opposite each other.

The piston 7 is carried by a hub 24 having a bearing at one end in a recess 25 made in the inner face of the disk 9 forming one of the cylinder heads. The other end of the hub is elongated to form a nozzle extending through the bore 13 up to the shoulder 17 with which latter it is in engagement. This end of the nozzle also fits in the reduced portion 14 of the bore 13, and has a collar 26 abutting against the shoulder 16, and having its periphery in contact with the wall of the bore 13 adjacent to said shoulder. That portion of the bore 13 adjacent to the shoulder 16, and the reduced portion 14 of the bore, are therefore made to serve as a bearing for this end of the hub. The contiguous ends of the hub and the piston are halved, and by bolts 27 passing therethrough, the parts are rigidly secured together.

The nozzle formed by the hub 24 has its discharge end terminating at the inner end of the flared portion 15 of the bore 13, and is formed with a spiral passage 28 which is in axial alinement with said flared portion of the bore 13, and with the passage 18. This spiral passage tapers in the direction of the discharge end of the nozzle, said end being made slightly flared as indicated at 29, the spiral stopping at the commencement of said flared portion.

In operation, the piston 7 is rotated when steam or other fluid under pressure is let into the cylinder, by the impact of said fluid against the piston wings 19. Inasmuch as the piston is made fast to the nozzle-shaped hub 24 the latter will rotate with the piston and the fluid to be pumped will be drawn

through the spiral passage 28, and discharged from the smaller end thereof through the flared portion 15 of the bore 13, the same therefore constituting the outlet of the pump. The outer surface of this section of the pump casing has an exteriorly threaded portion 30, to which a pipe may be connected for conducting the fluid to its destination. The inlet section of the pump casing also has an exteriorly threaded portion 31 for connection to the suction pipe.

The pump can be employed for pumping hot or cold water, oil, or other liquid of any kind, and it can be driven by either air, steam, belt or suitable gearing. If desired, the turning plug 18ª may be dispensed with. A packing nut can be mounted on the small end of the nozzle to prevent water from getting into the steam space, and at the same time assisting to support the end thrust on the rear end of the nozzle. The number of piston wings may be increased if necessary.

What is claimed is:

1. A rotary pump comprising a casing containing a passage one end of which is the pump inlet, and the other end the outlet, and said casing having a chamber intersecting the passage intermediate its ends, with fluid-pressure inlets and outlets to said chamber, a hub mounted in the passage, and having a spiral opening in line therewith, a rotor carried by the hub, and working in the aforesaid chamber, and sliding wings carried by the rotor in constant contact with the wall of said chamber.

2. A rotary pump comprising a casing containing a passage, one end of which is the pump inlet, and the other end the outlet, and said casing having a chamber intersecting the passage intermediate its ends, with fluid-pressure inlets and outlets to said chamber, a hub rotatably mounted in the aforesaid passage, and having a spiral opening in line therewith, said opening being tapered in the direction of the outlet end of the passage, a rotor carried by the hub, and working in the aforesaid chamber, and sliding wings carried by the rotor in constant contact with the wall of the chamber.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

GEORGE W. KELLER.
EDWARD C. GOETZ.

Witnesses:
JOHN G. SHAW,
RAY H. DEWENDECK.