

J. GRINDROD.

PUMP.

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996,984.

Patented July 4, 1911.

Fig. 1.

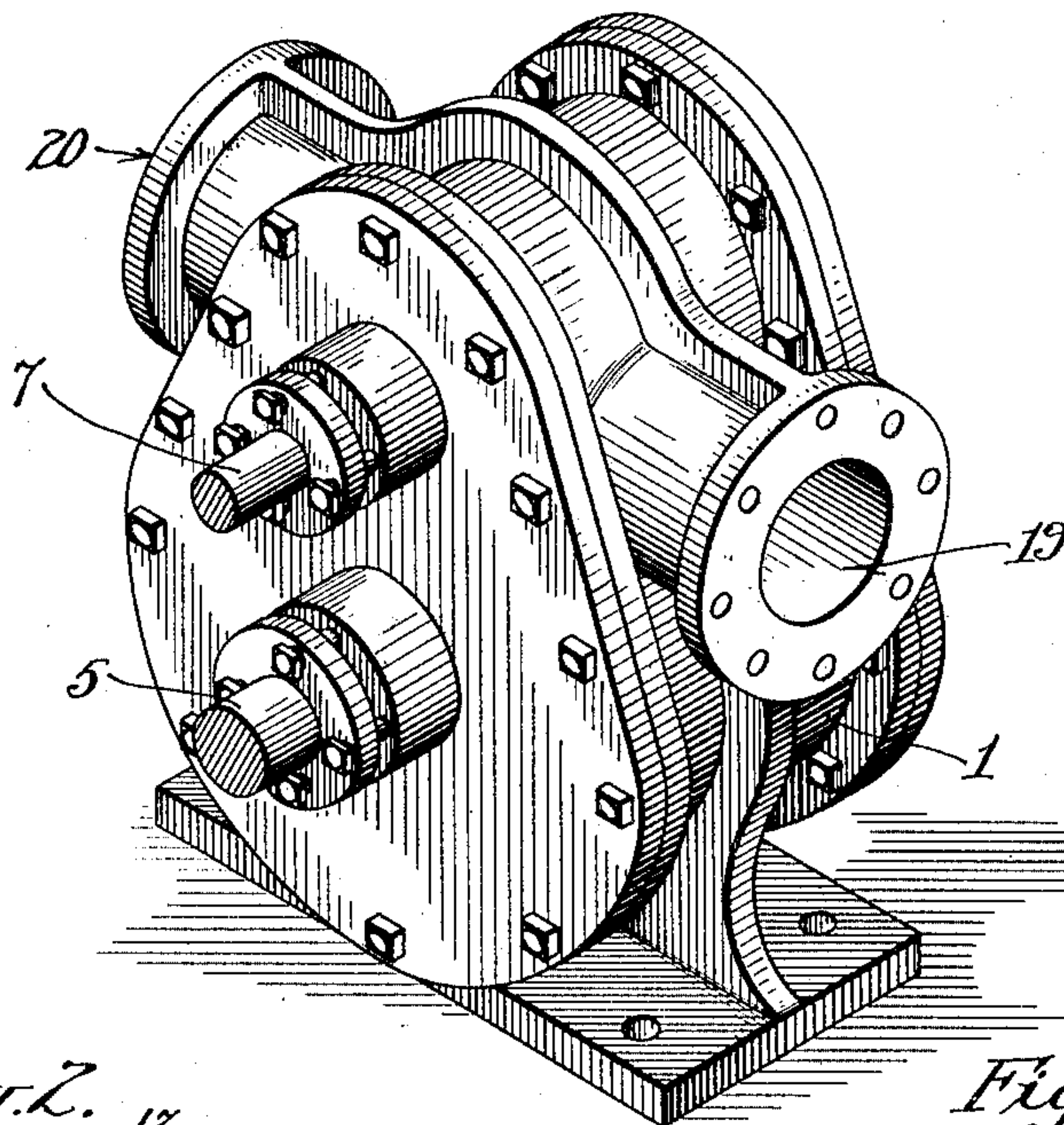


Fig. 2.

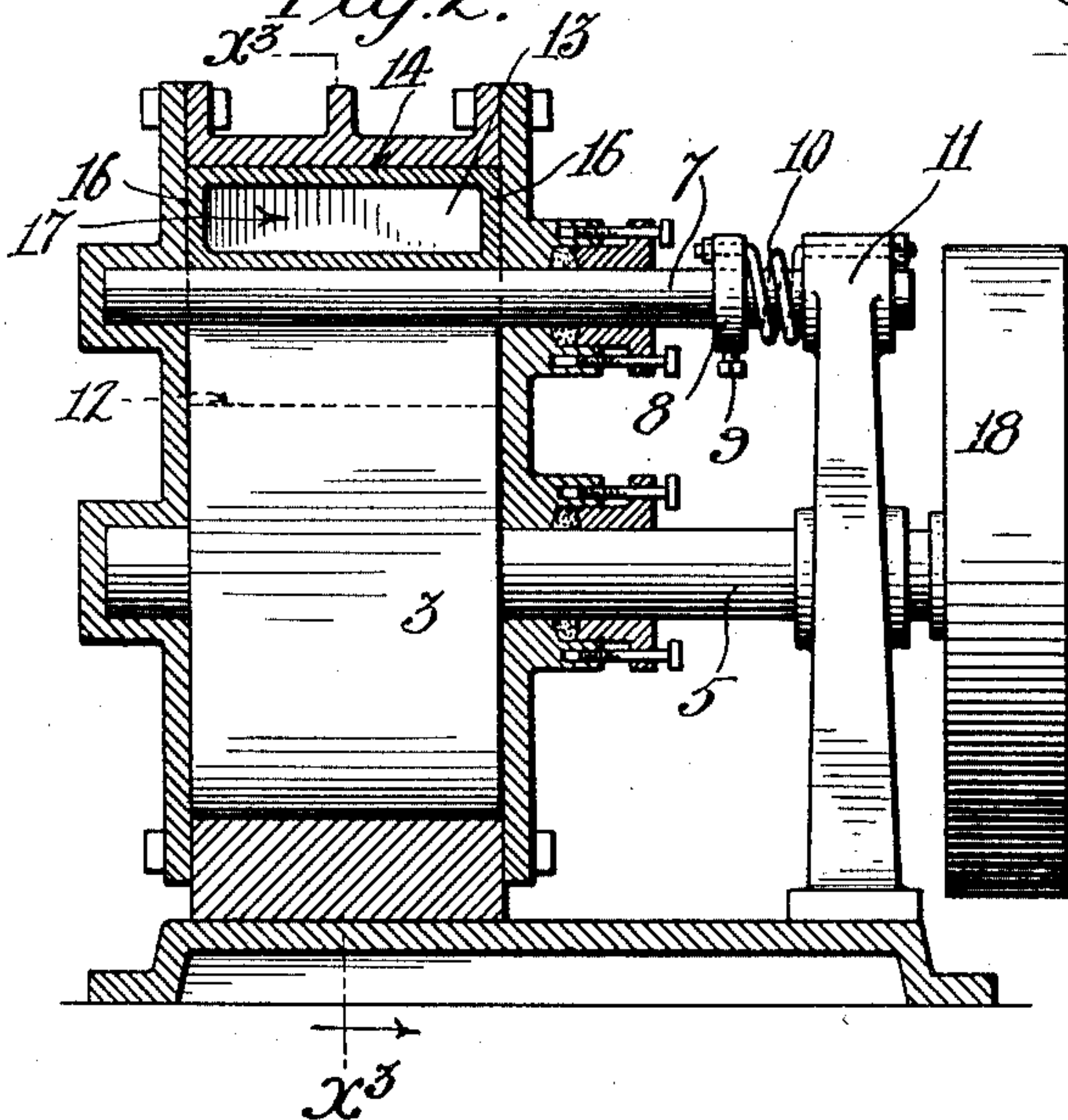
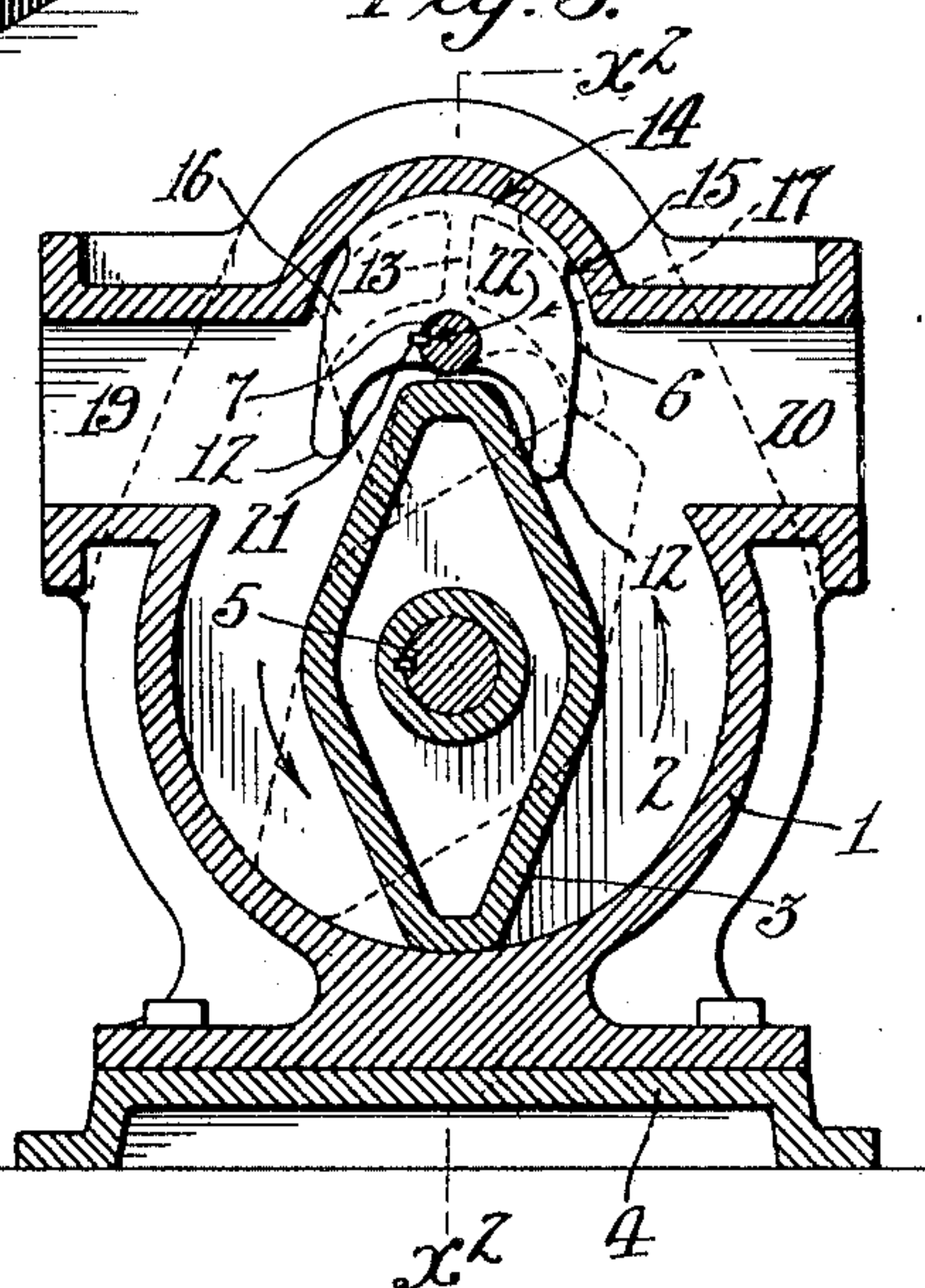


Fig. 3.



Witnesses:
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by *Thomas D. Hackett*
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UNITED STATES PATENT OFFICE.

JOHN GRINDROD, OF BAKERSFIELD, CALIFORNIA.

PUMP.

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Specification of Letters Patent.

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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 and State of California, have invented a new and useful Pump, of which the following is a specification.

The principal object of my invention is to provide a direct acting pump of few parts and of simple construction.

Another object of my invention is to provide a pump having a piston, rotating runner or blade of irregular shape with deflecting or abutment means to coact with such piston or runner to arrest or deflect the course of and cause the liquid being pumped to leave the chamber in which the piston or runner rotates.

Another object of my invention is to provide means for the ready reversal of the pump.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective elevation of my pump, and driving pulley and its supporting bracket being removed. Fig. 2 is a vertical section on line x^2-x^2 of Fig. 3, the piston or runner being shown unbroken. Fig. 3 is a corresponding vertical section on line x^3-x^3 of Fig. 2.

1 is the pump casing which is provided on its interior with the piston or runner chamber 2.

3 is a piston, runner or blade, which for clearness I shall hereafter term a runner, mounted upon the shaft 5 to revolve in the chamber 2.

4 is the base supporting the pump and the shaft supporting bracket.

6 is a coacting abutment mounted upon the shaft 7.

8 is a collar mounted upon the shaft 7 and is provided with a set screw 9 to fix the collar to the shaft 7.

10 is a spring encircling the shaft 7 and having one of its ends fastened to the collar 8 upon the shaft 7 and its other end made fast to the bracket or support 11.

The runner 3 is preferably of elongated elliptical form having irregular curvatures, all of the exterior of such runner coming within a certain radius when the runner is rotated upon its axis. The abutment 6 comprises a depending or contracting lip 12 and a wall or partition 13 provided at its upper side with a slidable contact 14 which moves

back and forth in the channel 15 provided in the top of the pump casing 1. In practice I provide an abutment having two pendant lips 12 on opposite sides of the partition 13, said lips forming a recess between them for receiving the runner, and one of said lips extending at each side of said recess. The slidable contacting portion 14 together with the lips 12, partition 13 and end walls 16 forms a pocket 17 in the abutment 6.

The lip 12 depends below the axis 7 of the abutment 6 and the distance from the lower edge of such lip to the center of the axis 7 is much greater than the length of the abutment from the axis 7 to the point of contact with the casing, as indicated by 14 and 15 Figs. 2 and 3.

18 is a power driven means to actuate the shaft 5 and the runner 3 mounted thereon. Supposing that the runner is rotated in the direction indicated by the arrows, as shown in Fig. 3, the collar 8 on the shaft 7 is set to throw the torsion of the spring 10 in a direction to cause the shaft 7 to cause the lip 12 to contact with the runner as shown in Fig. 3. The lip 12 follows over the surface of the runner, as shown in dotted lines Fig. 3, being initially brought into contact by the spring 10. Liquid is brought into the piston chamber 2 through the inlet port 19 and carried around the chamber by the runner blade, the depending lip of the abutment at all times being in contact with the runner, the liquid being driven by the blade is deflected outwardly through the outlet port 20. The inlet and outlet are of such size and are so located relatively to the casing, preferably diametrically opposite each other near the top, that the lips 12 are always at a distance from the abutment formed by the union of the lower walls of said inlet and outlet, respectively, and the wall of the casing. By arranging the ports in this manner the lips are never in a position to close the passage into or out of the casing and thus obstruct the flow of the liquid. On the contrary the only time the passages are closed is the short time in which the points of the runner pass across them, thereby giving the pump the greatest possible capacity with the greatest efficiency. The lips are placed so close together that when the pump is being rapidly operated if the contact lip should be thrown off or away from the edge of the runner the other lip would be drawn

into engagement with the runner and thereby stop the contact lip and enable the spring to quickly bring it back into its operative position.

5 When it is desired to reverse the direction of the runner for the purpose of pumping in the opposite direction, the collar 8 is loosened from the shaft 7 and torsion placed upon the spring 10 which will cause the
10 other depending lip 12 to come into contact with the surface of the runner, it of course being understood that the depending lips on the abutment are at all times of the same width as the runner, and that both the runner and abutment are fitted tightly against
15 the ends of the casing to prevent leakage. The lip 12 being of greater length from its point of contact with the runner to the axis 7 than the height of the abutment above the
20 axis 7 to the casing presents a greater area below the axis than that above the axis, and the pressure exerted by any liquid being forced by the runner is greater below such axis than above the same, thereby overcoming
25 any tendency of the abutment lip to leave the surface of the runner. It is apparent that the two before mentioned surfaces can be so proportioned by the location of the axis so that a greater or less pressure
30 can be brought to bear upon the lip and its contact with the runner regulated to suit different purposes.

The abutment coacts with the face of the runner to form deflecting means, therefore
35 I have termed the abutment a coacting abutment and desire the same to apply to any means acting in conjunction with a revolvable piston or runner to contact with and deflect and stop the course of a liquid being
40 actuated by such piston or runner.

The coacting abutment 6 is made fast to the axis 7 by means of a key 21 seated in a key way 22 in the axis, and the torsion of the spring 10 at all times is exerted to keep
45 the lip 12 in contact with the runner. I have shown the lip 12 as being curved downwardly, but other configuration of the same may be employed so long as the lip is provided with an axis which allows of the lip
50 to contact with the runner surface during its entire revolution. When two lips are employed, as illustrated, the side which is not

used as an abutment is wholly inactive, therefore, if a pump is desired, to pump only in one direction one of the lips may be
55 dispensed with.

My pump is especially designed to pump oil or other heavy liquids.

Now having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a pump, the combination of a casing provided with an inlet and an outlet and having a cylindrical chamber and a channel therebetween, an elliptical runner rotatably mounted in the casing, and an abutment rotatably mounted in said channel and provided with two lips, each lip being of a greater length from the pivot of the abutment to its tip than from said pivot to the
65 wall of the channel, but of a less length than the distance from said pivot point to the junction of the wall of the chamber and the walls of said inlet and outlet, respectively, whereby the pressure of the fluid being expelled will hold one lip in contact with the
70 runner at all times without causing the other lip to close the inlet.

2. In a pump, the combination of a casing provided with an inlet and an outlet and
80 having a cylindrical chamber and a channel therebetween, an elliptical runner rotatably mounted in said casing in position to have its edges engage with the inner wall of the casing, and an abutment rotatably mounted
85 in said channel, said abutment comprising end pieces, a centrally arranged partition having a contact portion at its outer edge, and a depending lip upon each side of the partition, thereby forming a pocket upon
90 each side of the abutment, said lips being longer from the pivot of the abutment than the distance from the pivot to the wall of the channel, but of a less length than the distance from said pivot point to the junction of the wall of the cylinder and the walls
95 of said inlet and outlet, respectively.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 3rd day of July 1907.

JOHN GRINDROD.

In presence of—

F. M. TOWNSEND,

FRANK L. A. GRAHAM.