



E. FOURNIER.  
ROTARY ENGINE.

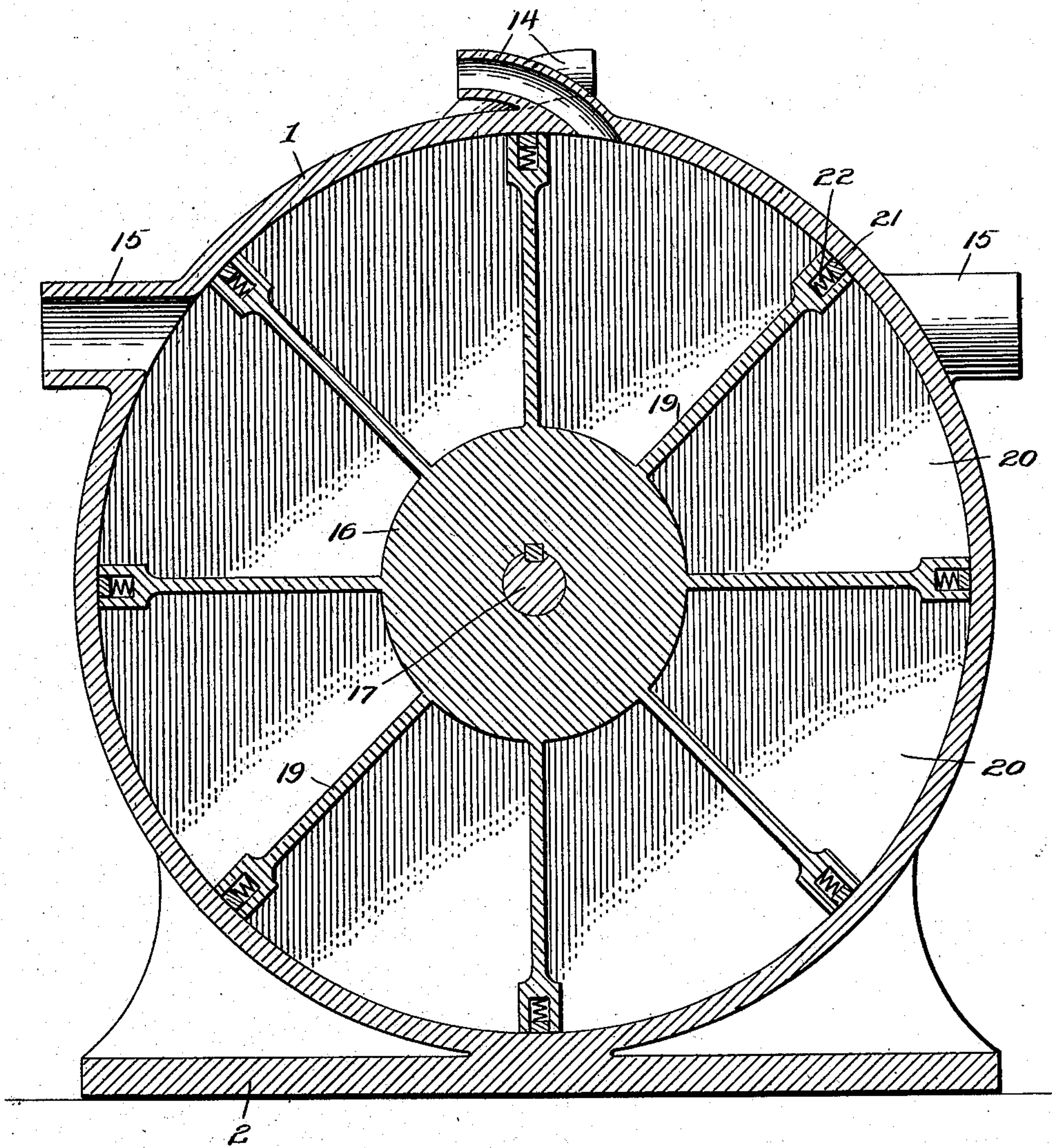
APPLICATION FILED APR. 4, 1908.

899,485.

Patented Sept. 22, 1908.

3 SHEETS—SHEET 2.

*Fig. 2.*



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Witnesses

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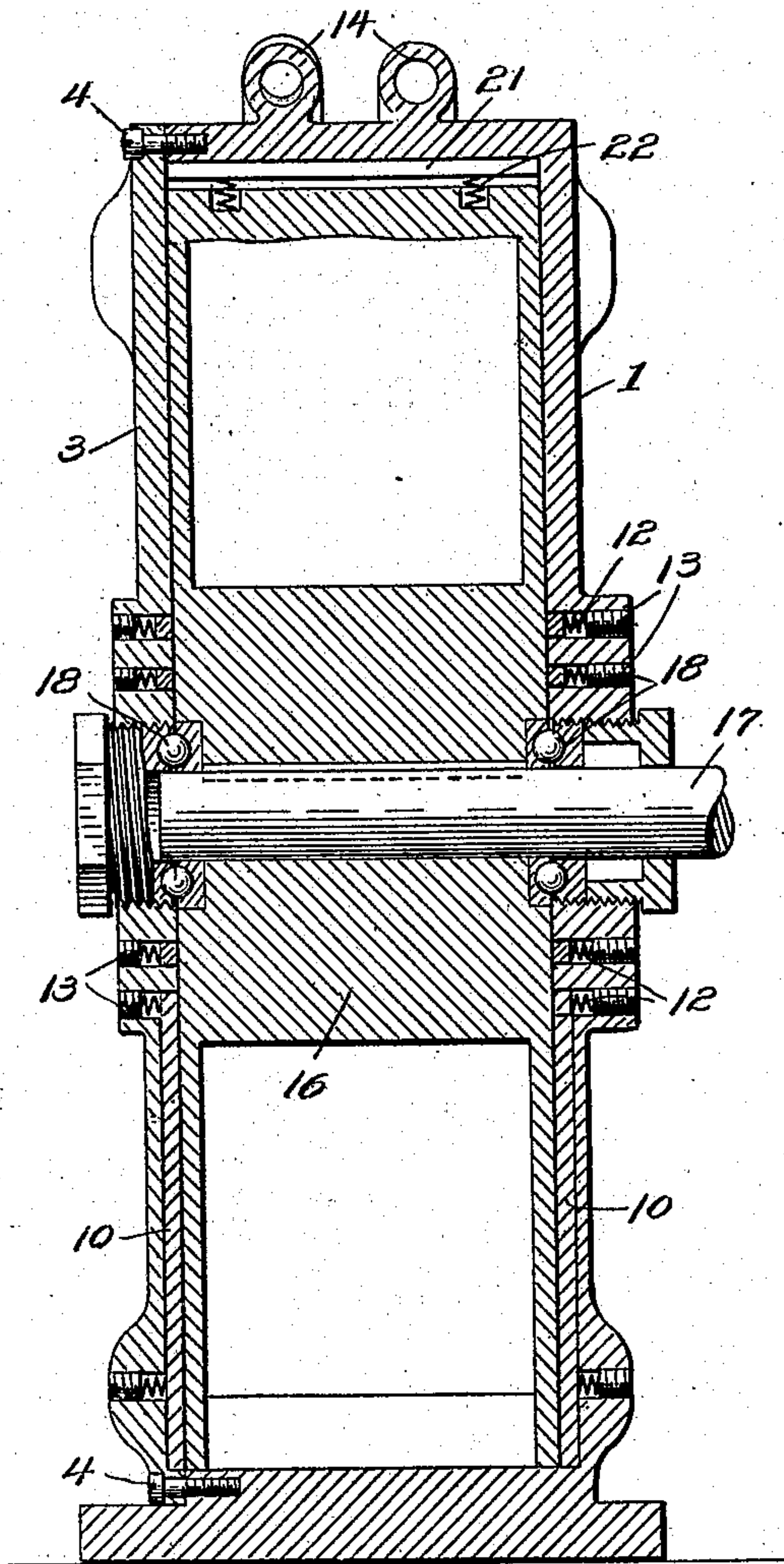


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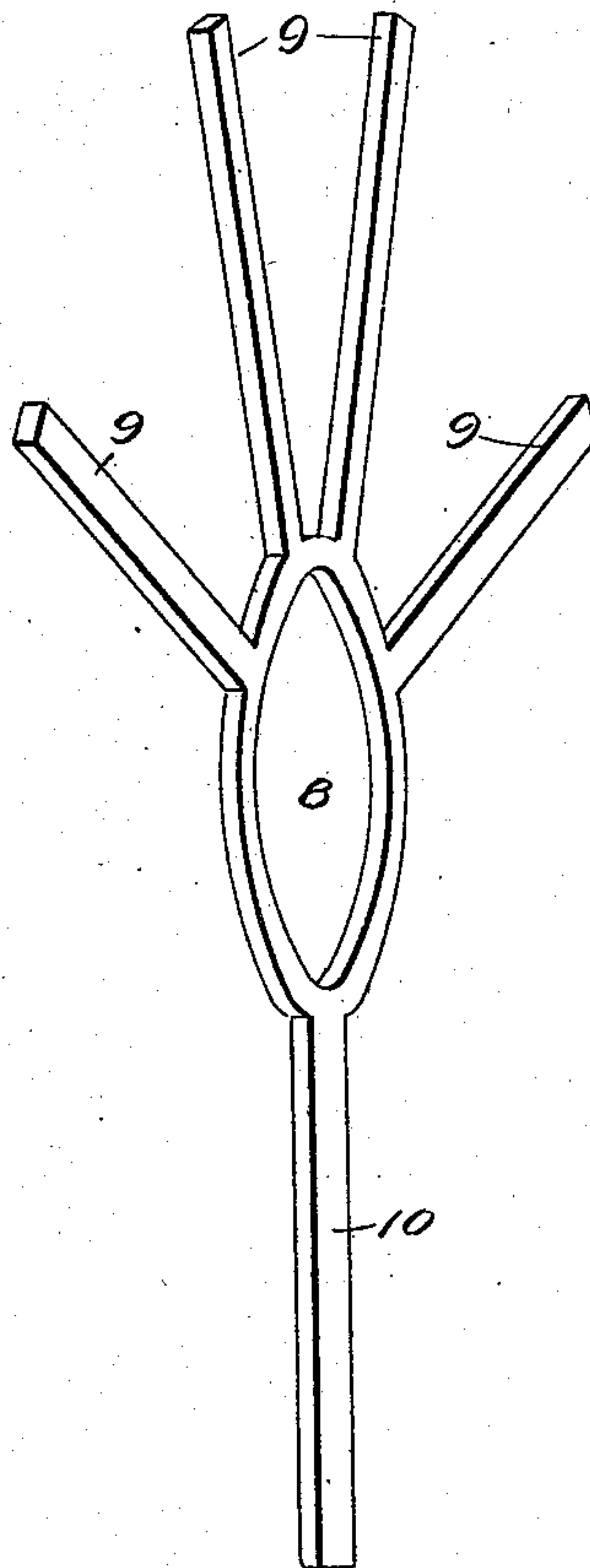
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*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

EDWARD FOURNIER, OF MINNEAPOLIS, MINNESOTA.

## ROTARY ENGINE.

No. 899,485.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed April 4, 1908. Serial No. 425,291.

*To all whom it may concern:*

Be it known that I, EDWARD FOURNIER, a citizen of the United States of America, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to rotary engines, and one of the principal objects of the same is to provide a simple reversible rotary engine of few parts which cannot readily get out of order.

Another object of the invention is to provide improved means for packing the cylinder walls against which the rotating piston bears.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation looking into the cylinder with the face plate removed therefrom, the piston and packing removed. Fig. 2 is a vertical section taken through the cylinder and through the rotating piston. Fig. 3 is a vertical section taken at right angles to Fig. 2, showing one of the piston walls broken away. Fig. 4 is a detail perspective view of the packing spider for the inner cylinder wall and face plate.

Referring to the drawings for a more specific description of my invention, the numeral 1 designates the cylinder mounted upon a suitable base 2. This cylinder is hollow and is provided with a suitable face plate 3 to close one end thereof, said face plate being connected to the cylinder by means of screws or lag bolts 4. Formed in the inner wall of the cylinder is a recess comprising a circular portion 5 and radial branches 6 and 7. In the face plate 3 a similar recess is formed. Placed within this recess is the packing spider shown in Fig. 4 and consisting of a ring 8 and radial arms 9 and 10. It is to be noted that the arms 9 are comparatively close together and that the arm 10 is some distance from the other arms or branches. The purpose of this structure is that the arms 9 will cover the area between the two exhausts and the two intake ports, where the pressure of the steam is greatest, while the arm 10 merely supports and balances the remaining portions of the spider.

In order to hold the packing spider closely against the sides of the piston, holes 11 extend through the wall of the cylinder and

through the face plate 3, and seated in these holes are spiral springs 12 which bear against the arms of the spider, and set screws 13 inserted in the outer portions of said holes are used to adjust the tension of the springs 12 and to equalize the bearing at all points against the arms 9 and 10. Formed at the top of the cylinder are the reversely projecting intake ports 14 and oppositely disposed exhaust ports 15.

Mounted in the cylinder 1 is a piston having a hub 16 splined to a shaft 17, said shaft being mounted to rotate on ball bearings 18. The piston is provided with a series of blades or vanes 19 extending radially from the hub 16 and providing steam pockets 20 between said blades. At the outer ends of the blades 19 spring-pressed packing strips 21 are provided, said strips being mounted in recesses in the outer ends of the blades 19 and backed up by means of springs 22, as shown more particularly in Figs. 2 and 3.

The operation of my rotary engine may be briefly described as follows: The line of steam entering the intake port 14 shown in section in Fig. 2 will by impact force the blades or vanes 19 around within the cylinder, and each pocket 20 will exhaust through the exhaust port 15 shown in section in said view. When it is required to reverse the engine, the other intake and exhaust are utilized in an obvious manner. When the piston has been rotated by cranking sufficiently to give it an impetus the impact of the steam against the blades will be sufficient to rotate the piston.

From the foregoing it will be obvious that a rotary engine made in accordance with my invention is exceedingly simple in construction, is capable of reversal, is composed of few parts which cannot readily get out of order, while the packing spider provides a permanent packing which will not require frequent renewals.

Having thus described the invention, what is claimed as new, is:—

1. A rotary engine comprising a cylinder and a face plate therefor, the inner walls of said cylinder and face plate being recessed in the form of a central ring and radial branches, a packing spider provided with a ring and radial arms conforming to the contour of said recesses and fitted therein, said spider being pressed inwardly by means of springs, and a piston comprising a hub and radial blades or vanes.

2. In a rotary engine, a cylinder provided



with a face plate, packing spiders fitted in recesses in said cylinder and face plate, a piston mounted on a shaft, said piston provided with radial blades or vanes, spring mounted  
5 packing strips, and inlet and exhaust ports formed in said cylinder.

3. A rotary engine comprising a cylinder having inlet and exhaust ports, a packing spider fitted into the walls of the cylinder, a  
10 face plate, and a packing spider fitted in the

said face plate, said packing spider comprising a ring and radial arms, said arms extending to the exhaust ports and including the intake ports.

In testimony whereof I affix my signature 15  
in presence of two witnesses.

EDWARD FOURNIER.

Witnesses:

G. C. LITTS,

H. I. GOOCH.