

C. KAISER.  
ROTARY STEAM ENGINE.

No. 66,092.

Patented June 25, 1867.

Fig. 3.

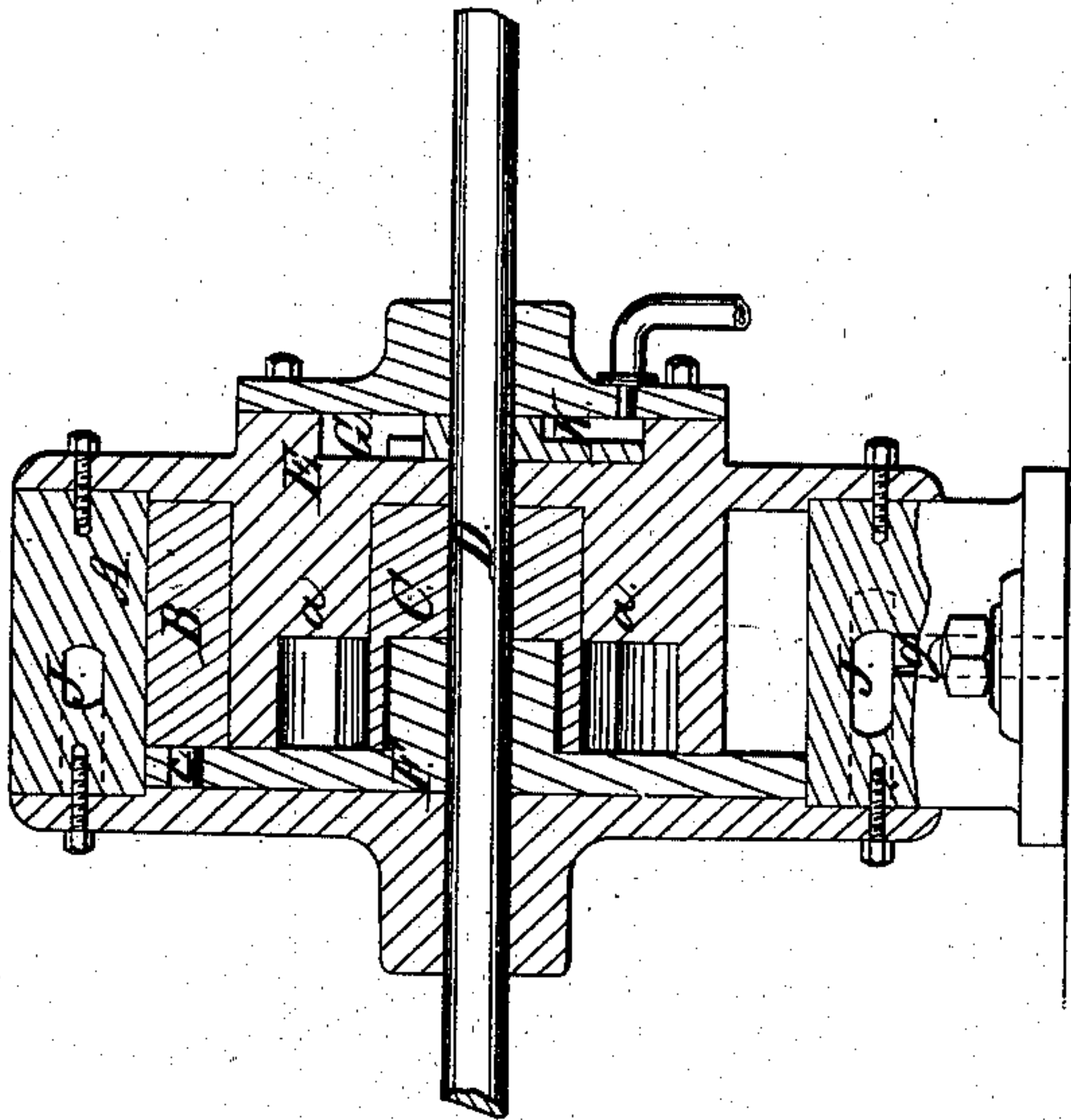


Fig. 4.

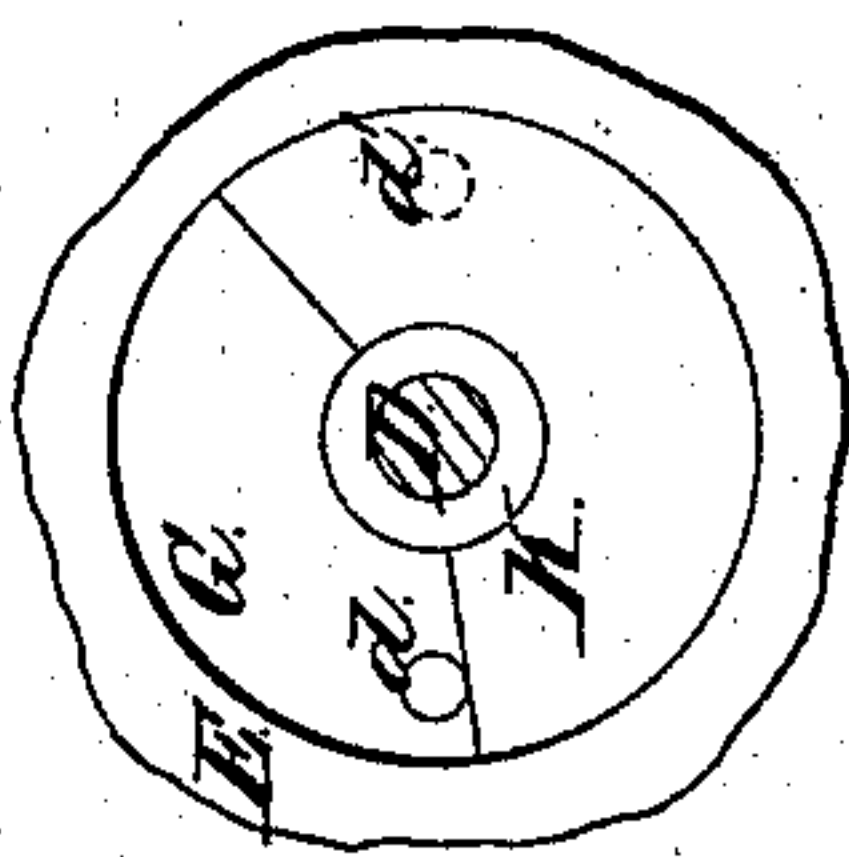


Fig. 1.

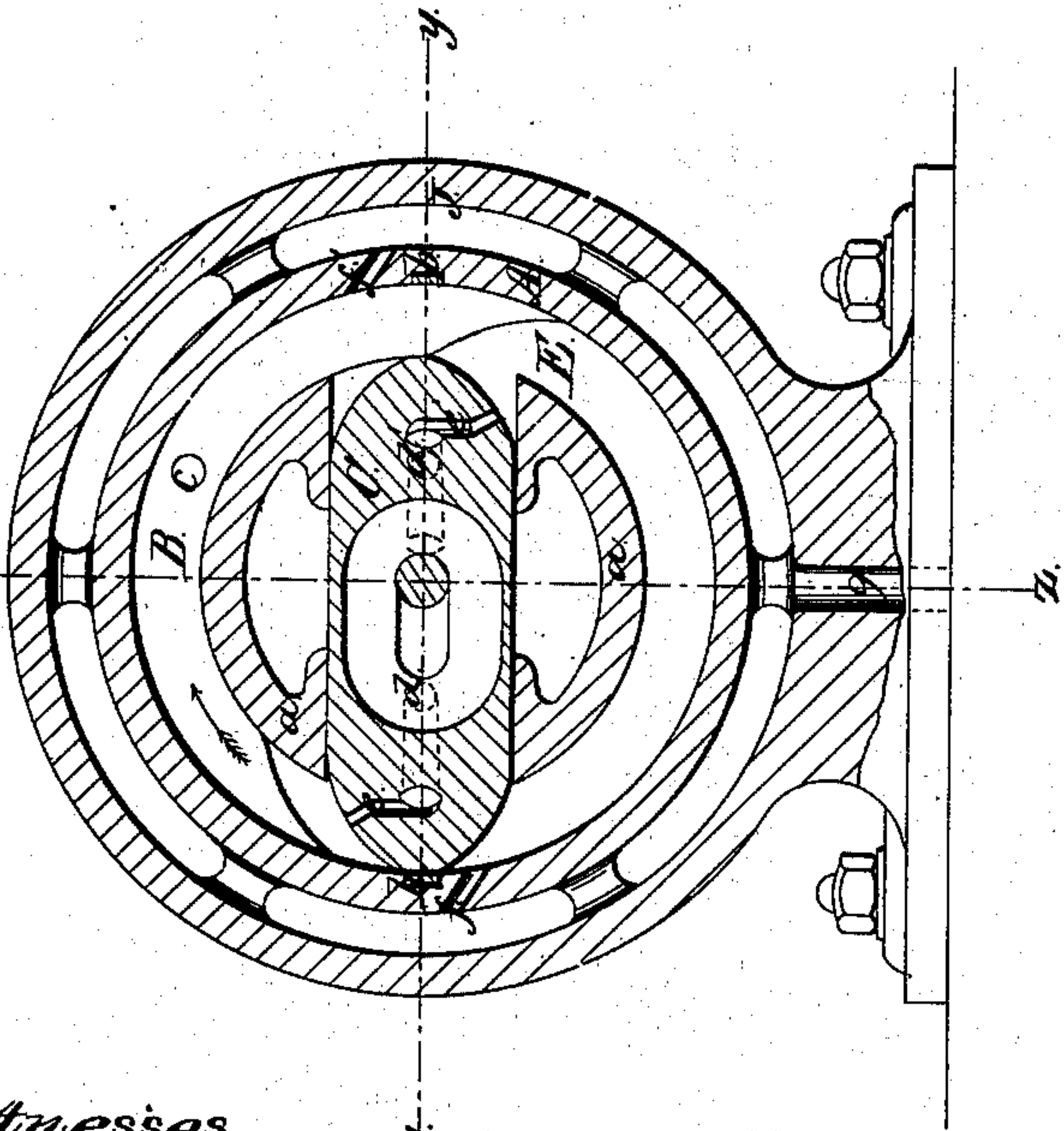
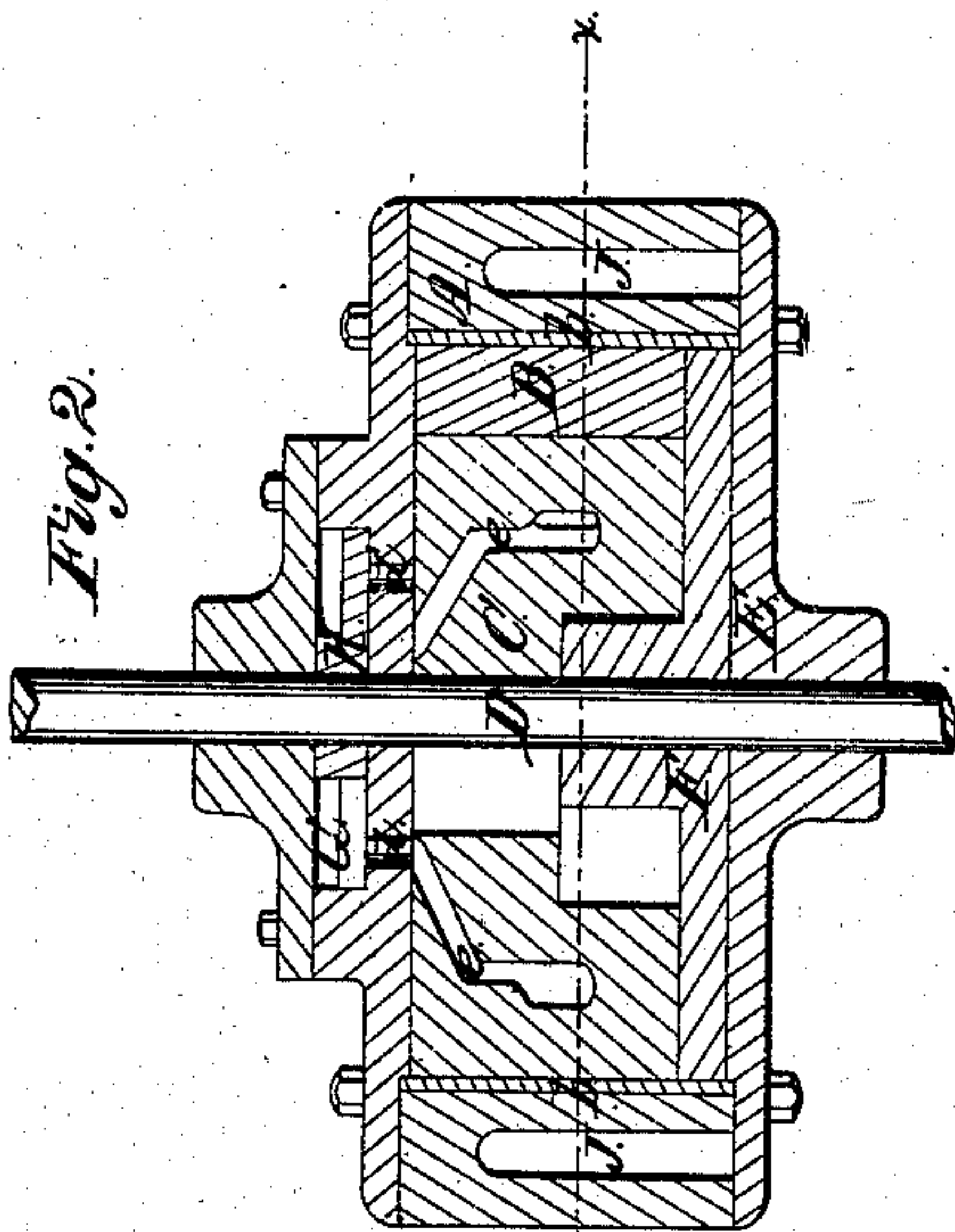


Fig. 2.



Witnesses.  
Geo. A. Southern  
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per  
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# United States Patent Office.

CHARLES KAISER, OF NEW YORK, N. Y.

Letters Patent No. 66,092, dated June 25, 1867.

## IMPROVEMENT IN ROTARY STEAM ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES KAISER, of No. 543 Pearl street, of the city, county, and State of New York, have invented a new and useful Improved Rotary Engine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a vertical section of this invention taken in the plane indicated by the line *x x*, fig. 2.

Figure 2 is a horizontal section of the same, the line *y y*, fig. 1, indicating the plane of section.

Figure 3 is a vertical section thereof, the plane of section being indicated by the line *z z*, fig. 1.

Figure 4 is a detached elevation of the cut-off.

Similar letters indicate corresponding parts.

This invention relates to a rotary engine in which a segmental piston is used, which acts in conjunction with a slide-valve extending diagonally through the centre of the cylinder. Said piston connects with the piston-wheel by means of a stud in such a manner that it is allowed to rock and that the steam itself is enabled to press the same up tight against the inner circumference of the cylinder. The ends of the piston are bevelled off, so that the same, on coming in contact with the slide-valve, will throw the same from one side of the cylinder to the other, whereby the steam is changed. The steam is admitted through the slide-valve and it exhausts through the sides of the cylinder into a steam jacket in such a manner that the cylinder is prevented from cooling off by the influence of the external atmosphere, and at the same time a free and unobstructed exhaust is provided. On the shaft of the piston-wheel is mounted a segmental disk, which acts as a cut-off, and by changing the position or shape of this disk the steam can be cut off at any desired point of the stroke.

A represents the cylinder of my rotary engine, which is bored out to receive the piston B. This piston is made in the form of a segment of an annular cylinder, and it moves in an annular space formed between the inner circumference of the cylinder and the outer periphery of two segmental guide-pieces *a*, which rise from one of the heads E of the cylinder, being cast solid with the same or otherwise firmly attached to it. Between these guide-pieces is fitted the slide-valve C, which extends diametrically across the cylinder, being provided with an oblong hole or slot, through which the shaft D passes in such manner that said slide-valve is free to move transversely across the cylinder until one or the other of its points touches the inner circumference of the same. The places where the points strike are furnished with suitable packing-pieces *b*, and the points of the slide-valve may also be packed, so that they will fit steam-tight against the cylinder and against the inner circumference of the piston. Said piston connects by a stud, *c*, with the piston-wheel F, which is mounted on the shaft D and which works steam-tight in the end of the cylinder and against the edges of the slide-valve, the guide-pieces *a*, and the piston B in such a manner that when said piston-wheel is carried round by the action of the steam on the piston the steam is prevented from leaking through under the inner surface of said piston-wheel. The ends of the piston are bevelled off to sharp edges, so that the same, in striking the slide-valve, cause the same to move from one side of the cylinder to the other, and the stud *c*, which forms the connection between the piston and piston-wheel, rises about from the middle of the piston, allowing the same to rock, so that the steam is enabled to press up that end of the piston, on which it acts tight against the inner circumference or sides of the cylinder, thus relieving the largest portion from being in contact with the surface of the cylinder. The steam is admitted from the boiler or generator into a chamber or steam-chest G situated in the head E, and from this chamber through ports *d d'* in the head, and through channels *e e'* in the slide-valve into the interior of the cylinder. The channels *e e'* pass obliquely through the slide-valve, and those ends of the same, which face the ports *d d'* are so situated that when the slide-valve is moved toward one side the channel *e* admits steam and the port *d* is closed, and when the slide-valve is moved toward the opposite side the channel *e'* admits steam and the port *d* is closed. The steam admitted through the channel *e* acts on the end of the piston B and causes the same to revolve in the direction of the arrow marked on it in fig. 1 and the steam before the piston exhausts through the ports *f*. As soon as the advancing end of the piston strikes the slide-valve said valve is thrown to the opposite side of the cylinder and the steam is changed. It is then admitted through the channel *e'* and it exhausts through the port *f'*. The exhaust steam passes into a jacket, J, which surrounds the cylinder, and from which the steam escapes through the pipe *g*. By these means the cylinder is kept warm and the condensation of the steam in its

interior is prevented. In the interior of the steam-chest G is the cut off K, which is composed of a segmental disk mounted on the shaft D, and made of such a shape that it closes the ports  $d d'$  at the desired point of the stroke. It will be readily understood by referring to fig. 4 that by changing the shape of this disk the steam can be cut off sooner or later, as may be desired. If desired, my engine can also be used with advantage as a pump, and in that case the jacket J can be dispensed with.

What I claim as new, and desire to secure by Letters Patent, is—

1. The segmental piston B moving in the cylinder A, in combination with the transversely sliding valve C, constructed and operating substantially as and for the purpose described.
2. Connecting the piston B to the piston-wheel F in such a manner that it is free to rock, substantially as and for the purpose set forth.
3. The slide-valve C and segmental piston B, in combination with the jacket J on the cylinder, constructed and operating substantially as and for the purpose set forth.
4. The cut-off K, in combination with the slide-valve C, segmental revolving piston B, and cylinder A, constructed and operating substantially as and for the purpose described.

CHARLES KAISER.

Witnesses:

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D. B. CHILDS.