

No. 809,149.

PATENTED JAN. 2, 1906.

D. B. STALKER.
ROTARY ENGINE.

APPLICATION FILED JAN. 16, 1905.

2 SHEETS—SHEET 1.

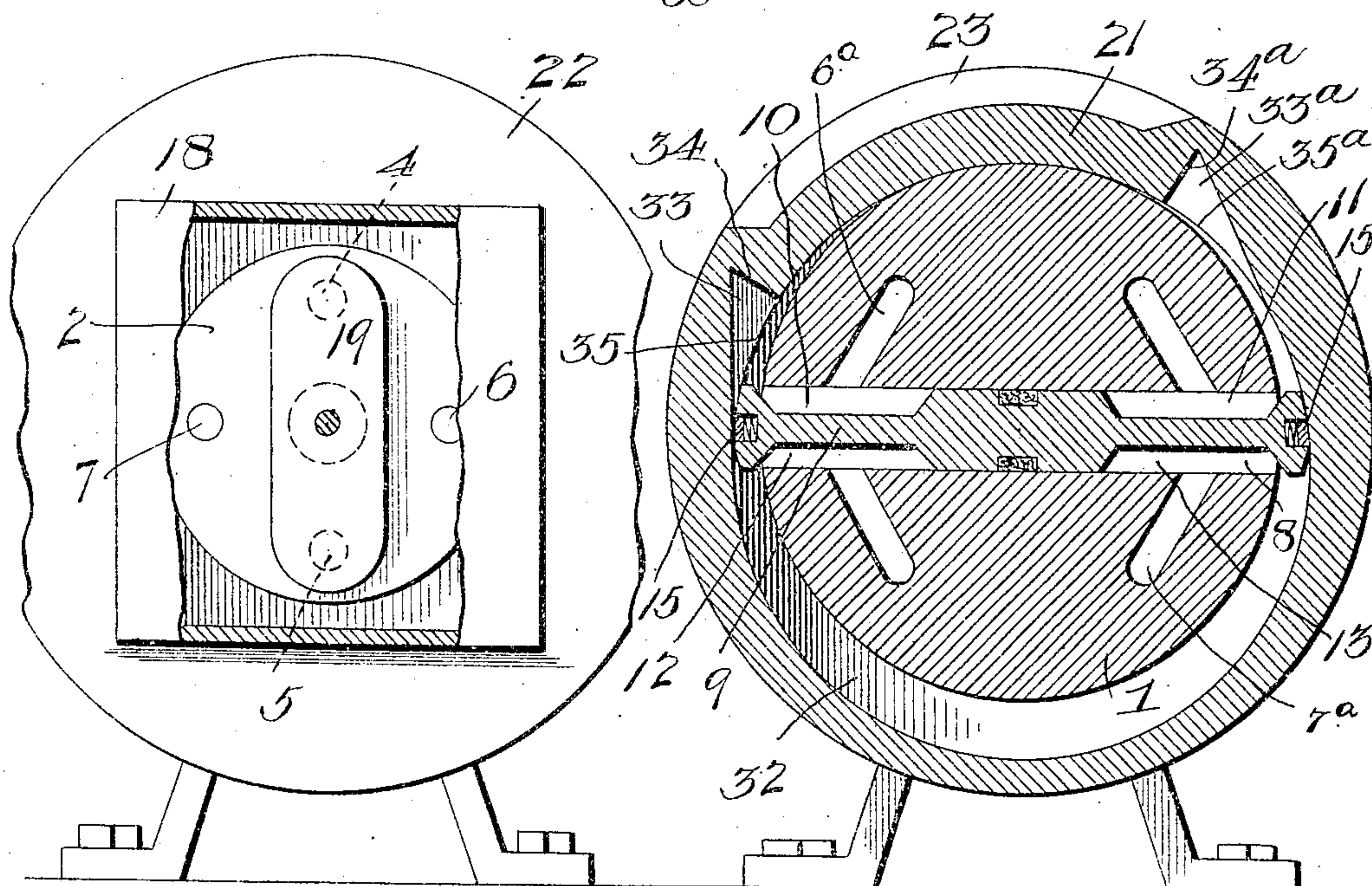
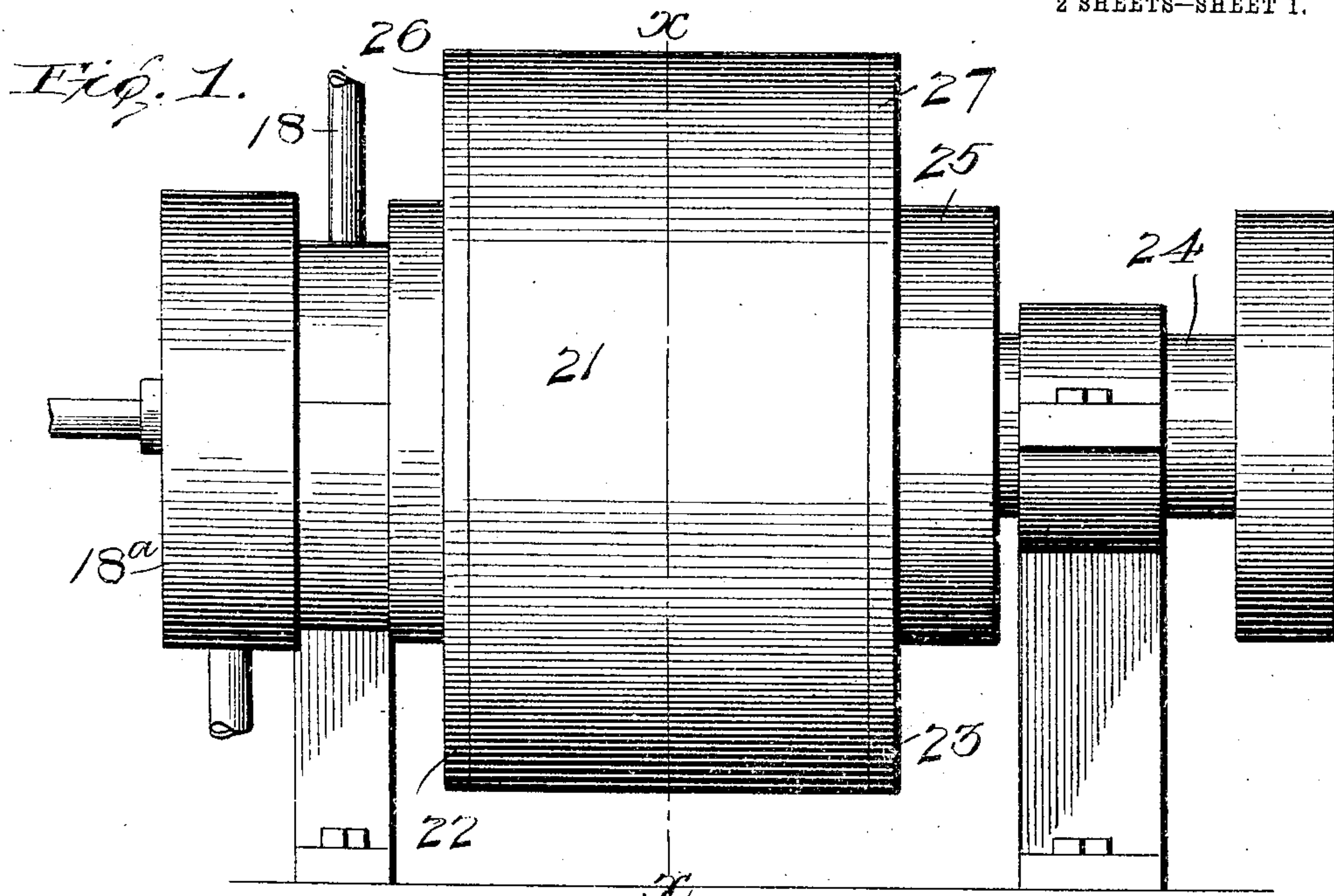


Fig. 2.

Fig. 3. Inventor
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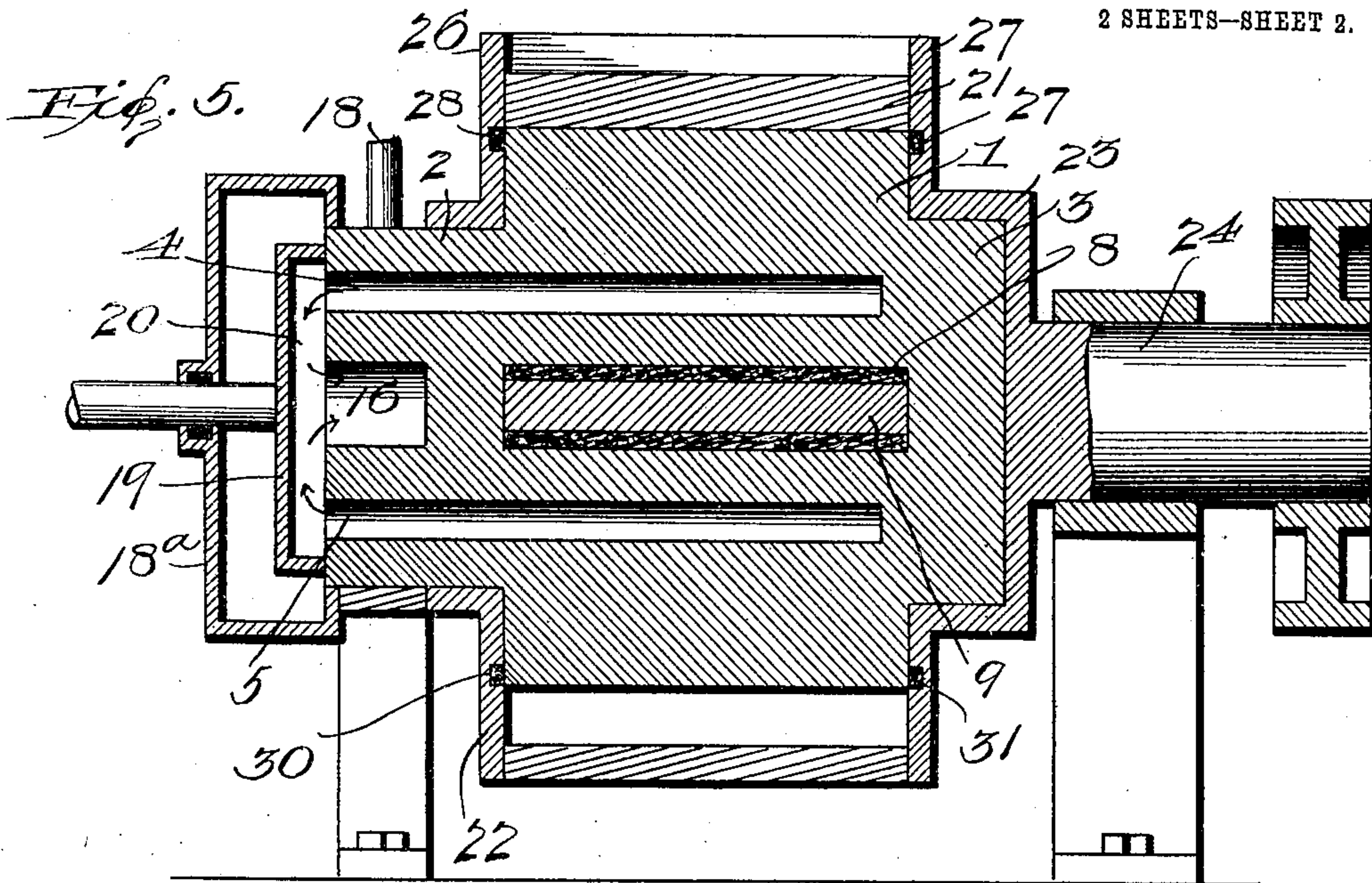
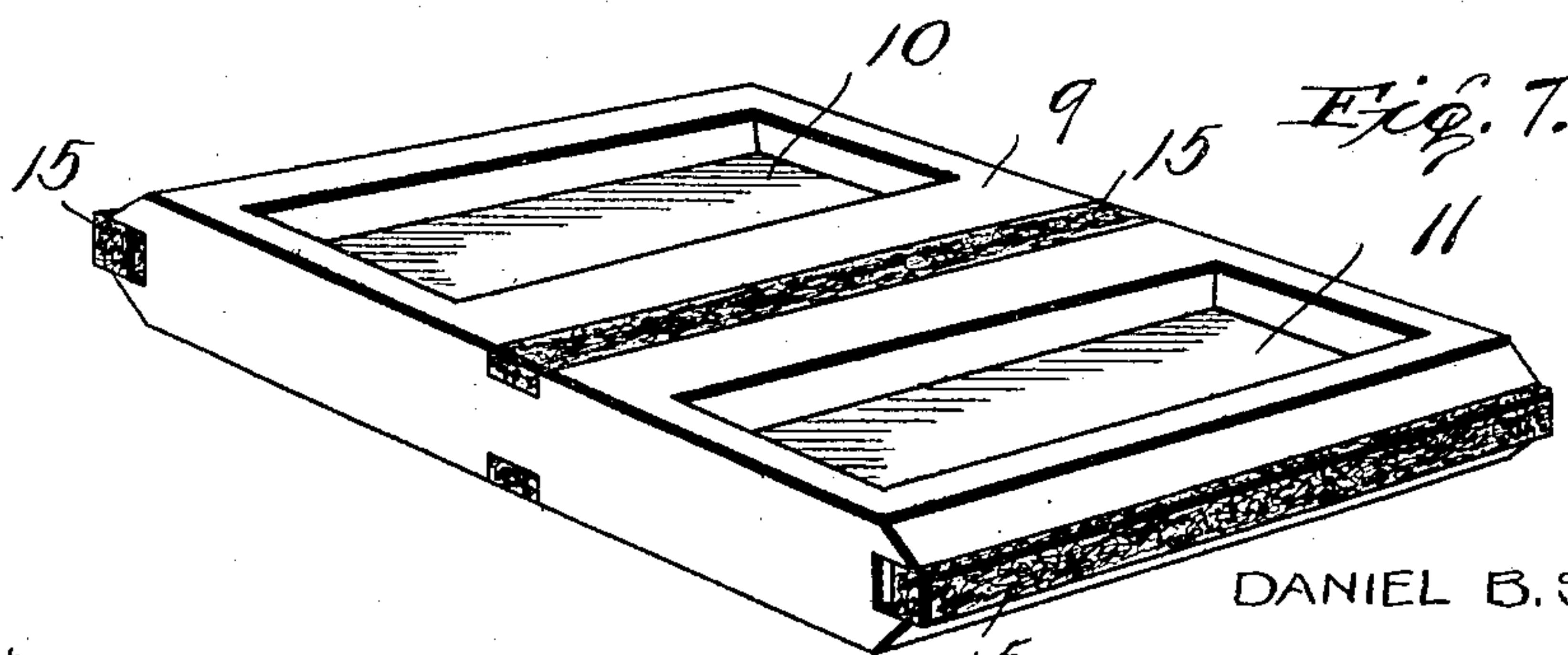
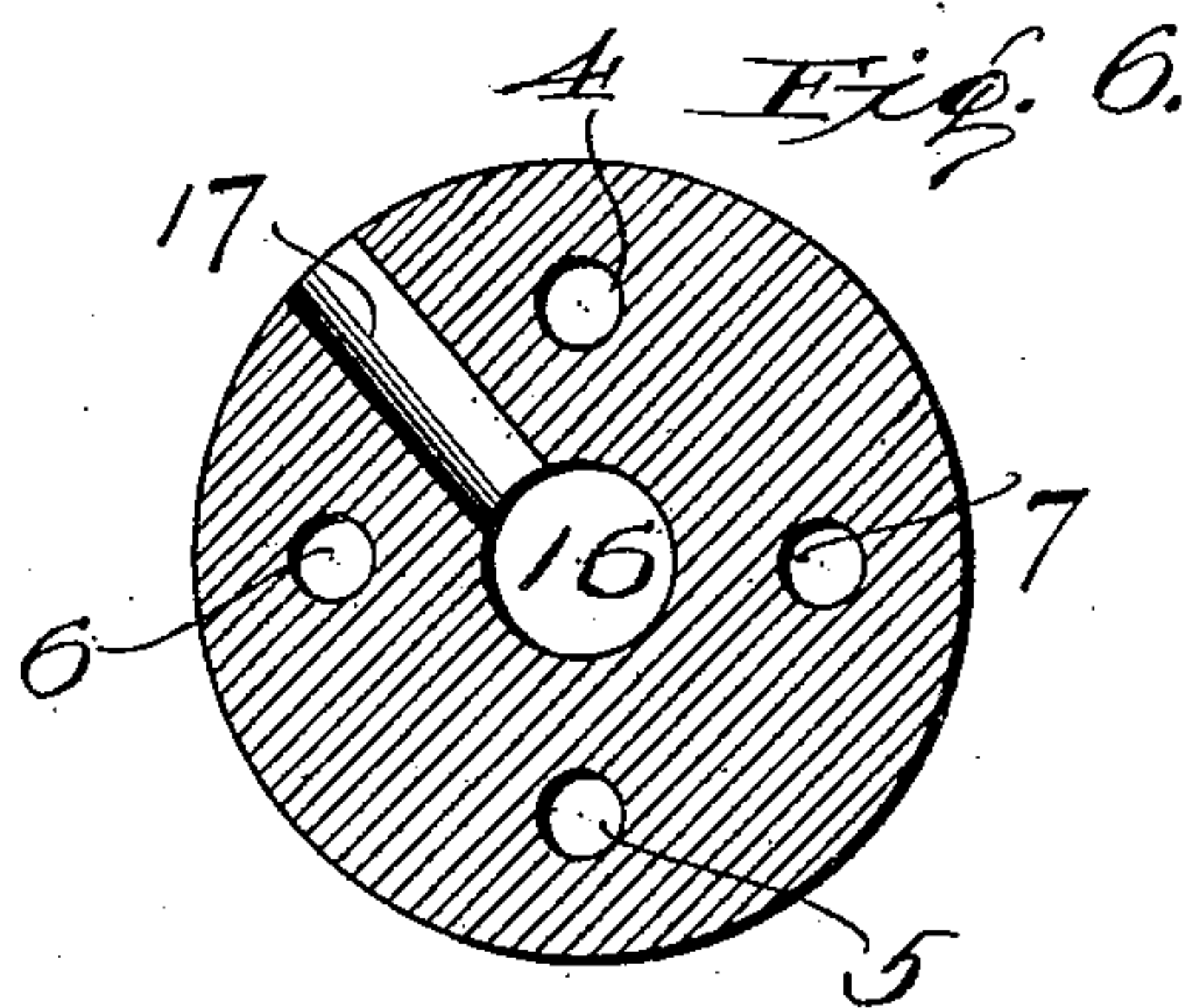
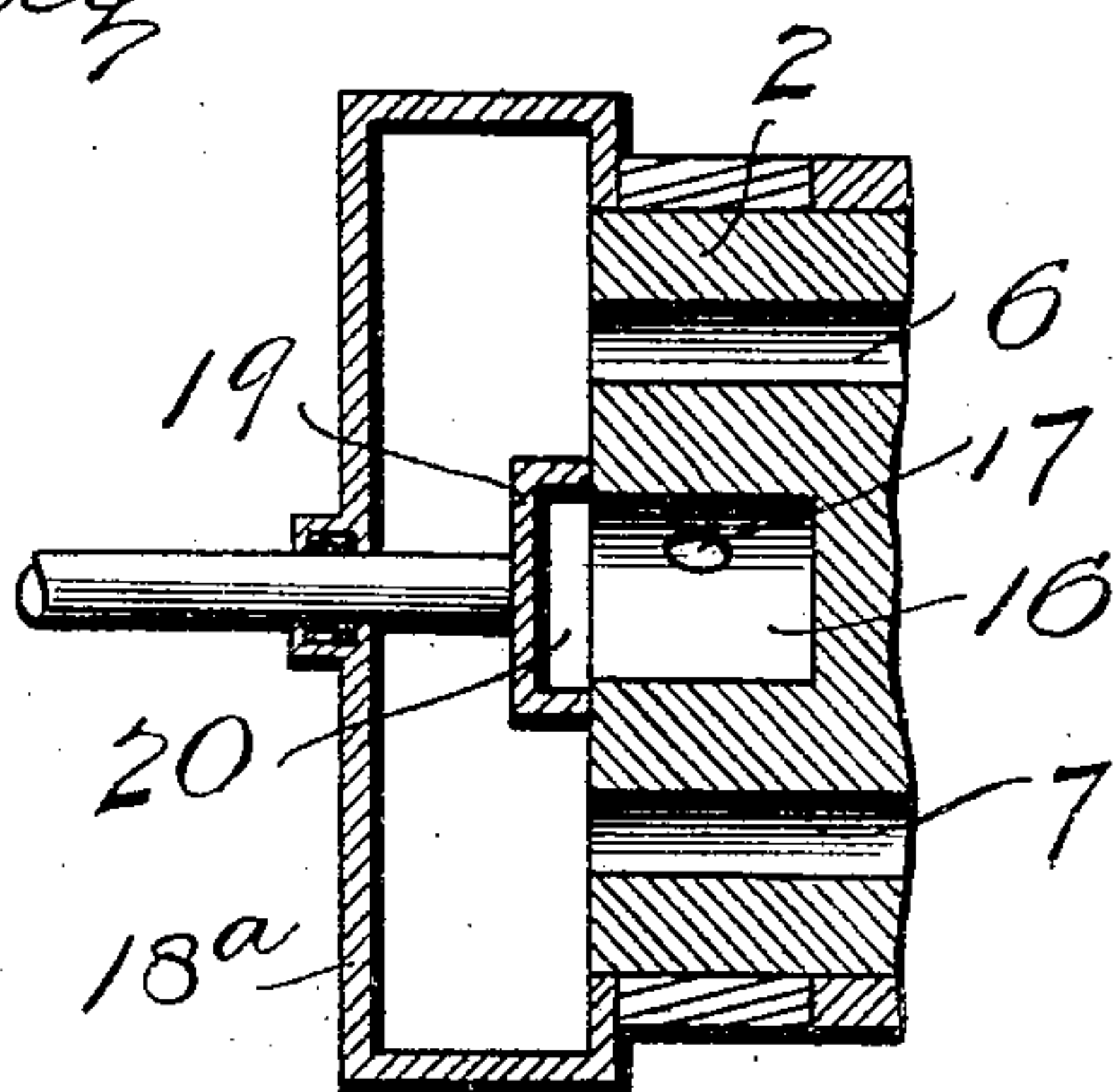


Fig. 4.



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UNITED STATES PATENT OFFICE,

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ROTARY ENGINE.

No. 809,149.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed January 16, 1905. Serial No. 241,300.

To all whom it may concern:

Be it known that I, DANIEL B. STALKER, a citizen of the United States, residing at Hot Springs, in the county of Garland and State of Arkansas, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to rotary engines of the class wherein the cylinder revolves.

It has for its object to provide an engine of this nature which is simple of construction, cheap of manufacture, and efficient in operation.

The invention consists in the details of construction and combinations of parts hereinafter described, and more particularly pointed out in the claims concluding this specification.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figure 1 is a side elevation of an engine made in accordance with my invention. Fig. 2 is an end elevation thereof with part of the steam-chest broken away. Fig. 3 is a cross-sectional view on the line $x x$ of Fig. 1. Fig. 4 is a longitudinal sectional view taken through the live-steam ports of the hub. Fig. 5 is a broken sectional view taken through the exhaust-ports of said hub. Fig. 6 is a sectional view on the line $y y$ of Fig. 5, showing the arrangement of passages in the seating-plate for the reversing-valve; and Fig. 7 is a perspective view of the slide-valve.

While the preferred embodiment of my invention is fully shown in the accompanying drawings and its construction and operation are clearly described in this specification, I reserve the right to make such changes from the construction shown and described herein as the scope of the claims hereunto appended will permit.

In carrying out my invention I provide a stationary cylindric hub suitably secured against rotation. Said hub is provided with four longitudinal openings or ports arranged approximately equidistant apart and from the outer surface of said hub. A cross-slot divides these four ports into pairs and has communication with each of said ports through passages arranged about midway of

the length of the hub. The cross-slot carries a reciprocating sliding valve having depressions or cavities on each side of the center on both faces. Grooves for spring packing-strips are provided in the edges of said slide-valve and down the center of each face thereof. A revoluble cylinder is mounted around said hub and is supported between end plates or rings adapted to rotate on end extensions of said hub. The interior of said cylinder is eccentric and has three centers. The reciprocating sliding valve projects beyond the hub on one side or the other at all times and when so projecting permits communication between the centers or depressions on the opposite faces of the projecting end with the eccentric passage in the cylinder. The hub extension through which the ports extend is provided with a central exhaust-hole in the center, with a passage leading therefrom between two of said ports. A reversing-valve mounted in the steam-chest, which is located adjoining the port end of the hub, is adapted to cover either pair of diametrically opposite ports and provide communication from each other with the central exhaust-port. The other pair of ports is left open, so that the steam from the steam-chest is free to enter them. The latter pair of ports therefore acts as live-steam ports, the steam passing through one by way of the passage connecting it with one of the cavities in the projecting end of the sliding valve through said pocket to the eccentric passage of the cylinder, which is provided with a pocket so formed and arranged that the steam will enter it and force the cylinder around half a revolution. After the pocket has completed a half-revolution the sliding valve is reversed and the steam passes through the other live-steam port and continues the revolution of said cylinder, so that it is continuously revolved. The exhaust-steam finds an exit at each step through the cavities in the opposite face of the sliding valve at the end of said valve which is projecting at the time through the exhaust-ports and reversing-valve. To provide for operating the engine in the opposite direction when the reversing-valve is turned to cover the other two ports, I provide an oppositely-arranged second pocket in the cylinder. It will be noted that said pockets are formed at the ends of the eccentric passage of the cylinder with their

steam-contacting shoulder or surface extending out flush with the hub.

Referring more particularly to the drawings, 1 is the hub, having end extensions 2 3 and the longitudinal ports 4 5 6 7, arranged equidistant apart and opening on the end 2 of the hub. Said hub is also provided with the cross-slot 8, carrying the reciprocating sliding valve 9. Said sliding valve is provided with cavities or recesses 10 11 12 13 in its opposite faces near each end. The edges and the central portion of each face of said valve are provided with slots 14, in which are mounted spring-pressed packing-strips 15. The end extension 2 of the hub is provided with a central exhaust-port hole 16, communicating by way of the passage 17 with the exhaust-pipe 18. The end 2 of said hub fits an opening in the steam-chest 18, in which is mounted a reversing-valve 19, having a passage 20, said valve adapted to cover either pair of diametrically opposite ports and place them in communication with the exhaust-port 16 and passage 17, leaving the other pair of ports open and free for the passage of steam.

Mounted around the fixed hub is the revoluble cylinder 21, arranged between end plates or rings 22 23, the former mounted around the end extension 2 of the hub and the latter around the end extension 3 of said hub. Said latter end plate 23 has a central projecting shaft 24, to which a drive-wheel may be attached to transmit the motive power of the engine, or a belt may be mounted directly on the extension 25 of said plate. The flanges 26 27 of said end plates are provided with circular grooves 28 29 for spring packing-strips 30 31. The interior of the cylinder is bored eccentrically, forming a passage 32, extending approximately two-thirds the way around the hub. At the edges of said eccentric passage are pockets 33 33^a, each opening on the eccentric passage and having a right-angled shoulder or surface 34 34^a abutting against the hub. Said pockets do not extend the whole length of the side of the cylinder, but are provided with ledges 35 35^a at each end for the ends of the sliding valve to rise up to reverse said valve.

The operation of the engine, as before broadly described, is as follows: When the reversing-valve is in the position shown in Fig. 2 covering the ports 4 and 5, the other ports 6 and 7 act as the live-steam ports, and the steam is fed alternately through their passages 6^a 7^a to the cavities 10 13 and the eccentric passage of the cylinder. The steam from the port 7, striking the pocket 33, forces the cylinder around half-way when the sliding valve is reversed, and the steam from port 6 carries it around the balance of the revolution. When the reverse-valve is turned ninety degrees, the exhaust-ports become live-steam ports, and vice versa, the steam in that case acting upon the pocket 33^a.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot, a slidable valve mounted in said slot, a revoluble cylinder having a passage extending part way around the hub within said cylinder, said passage ending in a shoulder means to reciprocate said slidable valve, and means to place said live-steam port in communication with said passage.

2. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot, a slidable valve mounted in said slot, a revoluble cylinder, having an eccentric passage ending with a pocket, mounted around said hub, and means to place said live-steam ports alternately into communication with said eccentric passage.

3. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot, a slidable valve mounted in said slot, a revoluble cylinder, having an eccentric passage ending in a pocket mounted around said hub, an exhaust-passage communicating with said exhaust-ports, means to place said live-steam ports alternately into communication with said means to place said exhaust-ports, alternately into communication with said passage.

4. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot, a slidable valve mounted in said slot, a revoluble cylinder, having an eccentric passage ending in a pocket, mounted around said hub, an exhaust-passage communicating with said exhaust-ports, said valve having means to place said live-steam ports alternately into communication with said eccentric passage, and means to place said exhaust-ports alternately into communication with said passage.

5. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot, a slidable valve mounted in said slot, a revoluble cylinder, having an eccentric passage ending in a pocket at each end, each pocket opening toward the passage, said valve having means to place said live-steam ports alternately into communication with said eccentric passage, and means to convert said live-steam ports into exhaust-ports and vice versa, whereby the engine may be reversed.

6. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot and passages from said live-steam and exhaust ports to said slot, a slidable valve mounted in said slot, said valve having recesses or cavities on both faces opposite said passages, a cylinder having an in-

terior cut-out portion forming a passage between said hub and cylinder, said cylinder having an interior shoulder, and means to reciprocate said valve whereby the live-steam ports are alternately placed into communication with the passage between said cylinder and hub.

7. In a rotary engine, a fixed hub having live-steam and exhaust ports therein, said hub having a cross-slot and passages from said live-steam and exhaust ports to said slot, a slidable valve mounted in said slot, said slot having recesses or cavities on both faces opposite said passages, a cylinder having an interior eccentric cut-out portion forming a passage between said hub and cylinder, said last-named passage ending in a pocket, said sliding valve adapted to be reciprocated by the eccentric form of said passage and said live-steam ports are alternately placed into communication with said eccentric passage.

8. In a rotary engine, a fixed hub having four ports, a cross-slot, passages connecting each of said ports with said slot and an exhaust-passage connecting with another central port, a steam-chest arranged at the opening of said ports, a reversing-valve having a passage therein adapted to cover either pair

of diametrically opposite ports and place them in communication with the exhaust-passage, a slidable valve mounted in said cross-slot, a revoluble cylinder having an eccentric cut-out portion ending in a pocket between said hub and cylinder, and means to place said live-steam ports alternately into engagement with said last-mentioned passage.

9. In a rotary engine, a fixed hub having a cross-slot, a slidable valve mounted in said slot, said valve having recesses or cavities in each of its faces separated by packing-strips, a rotary cylinder mounted around said hub and having an eccentric inner surface adapted to reciprocate said valve, said hub having live-steam and exhaust ports adapted to be alternately placed into communication with the interior of the cylinder by way of the recess in said valve, and said cylinder having pockets for the steam whereby said cylinder is rotated.

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

DANIEL B. STALKER.

Witnesses:

L. D. CAIN,

A. E. WALKLEY.