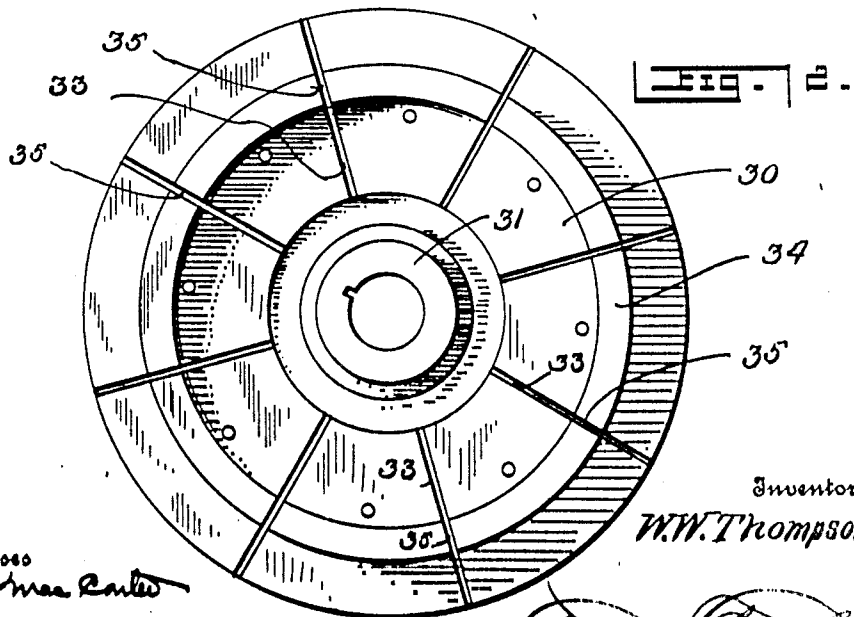
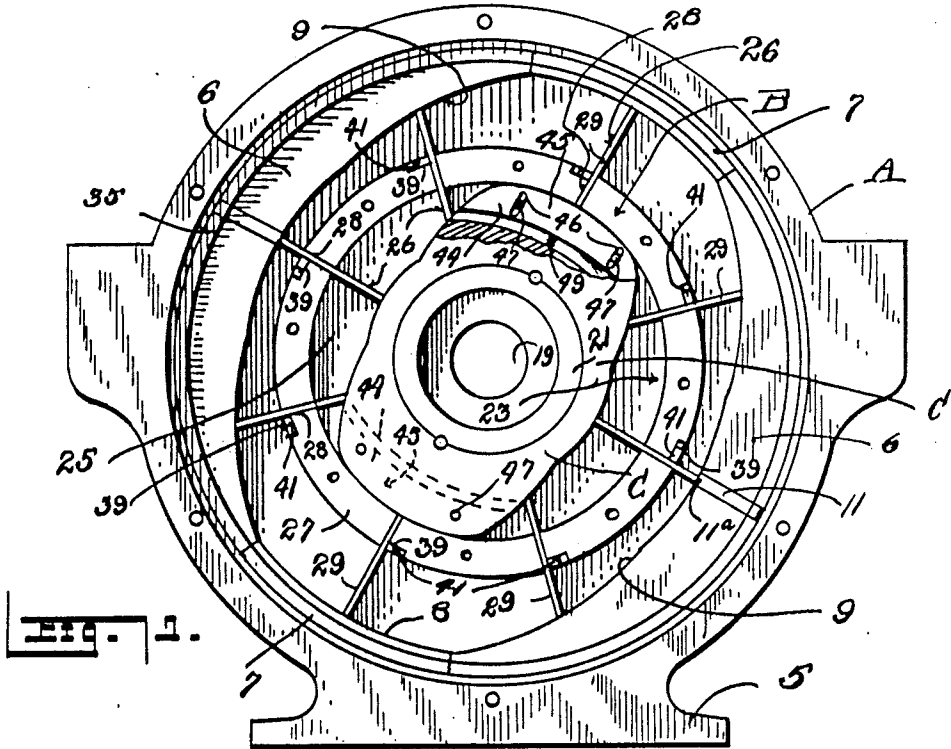


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 ROTARY ENGINE.
 APPLICATION FILED AUG. 13, 1912.

1,058,496.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 1.



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FIG. 5.

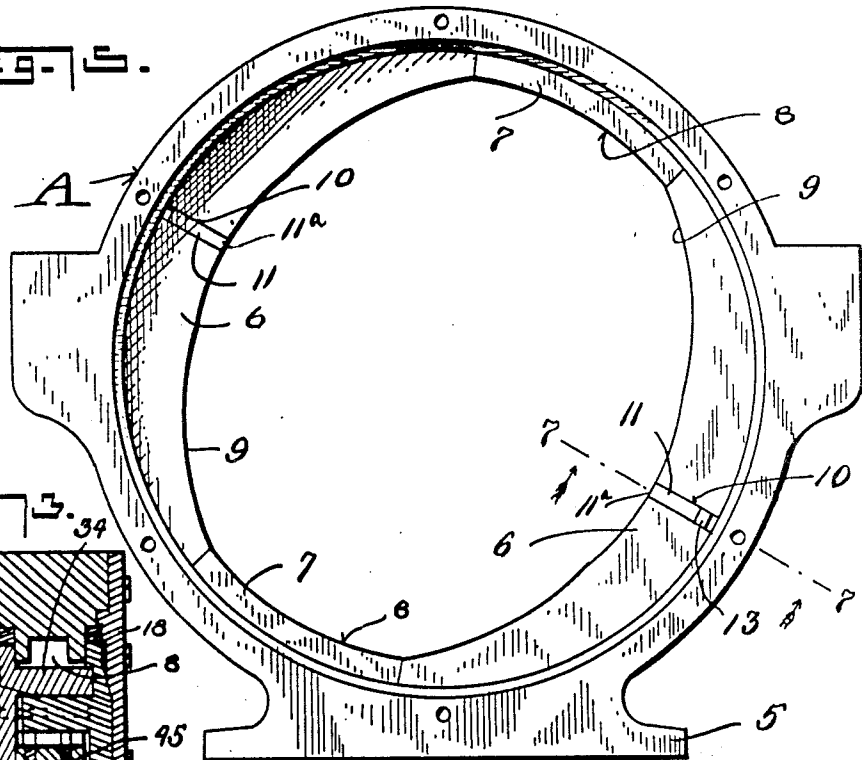


FIG. 6.

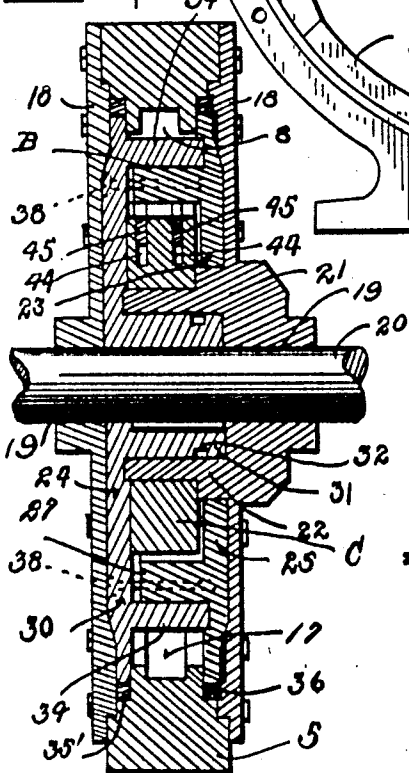
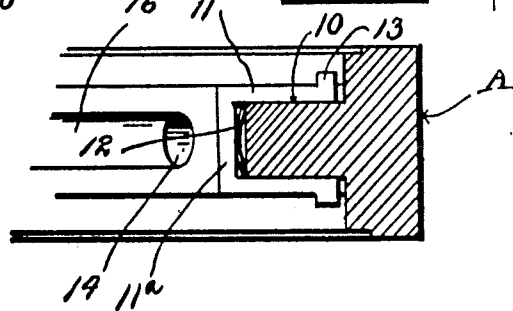


FIG. 7.



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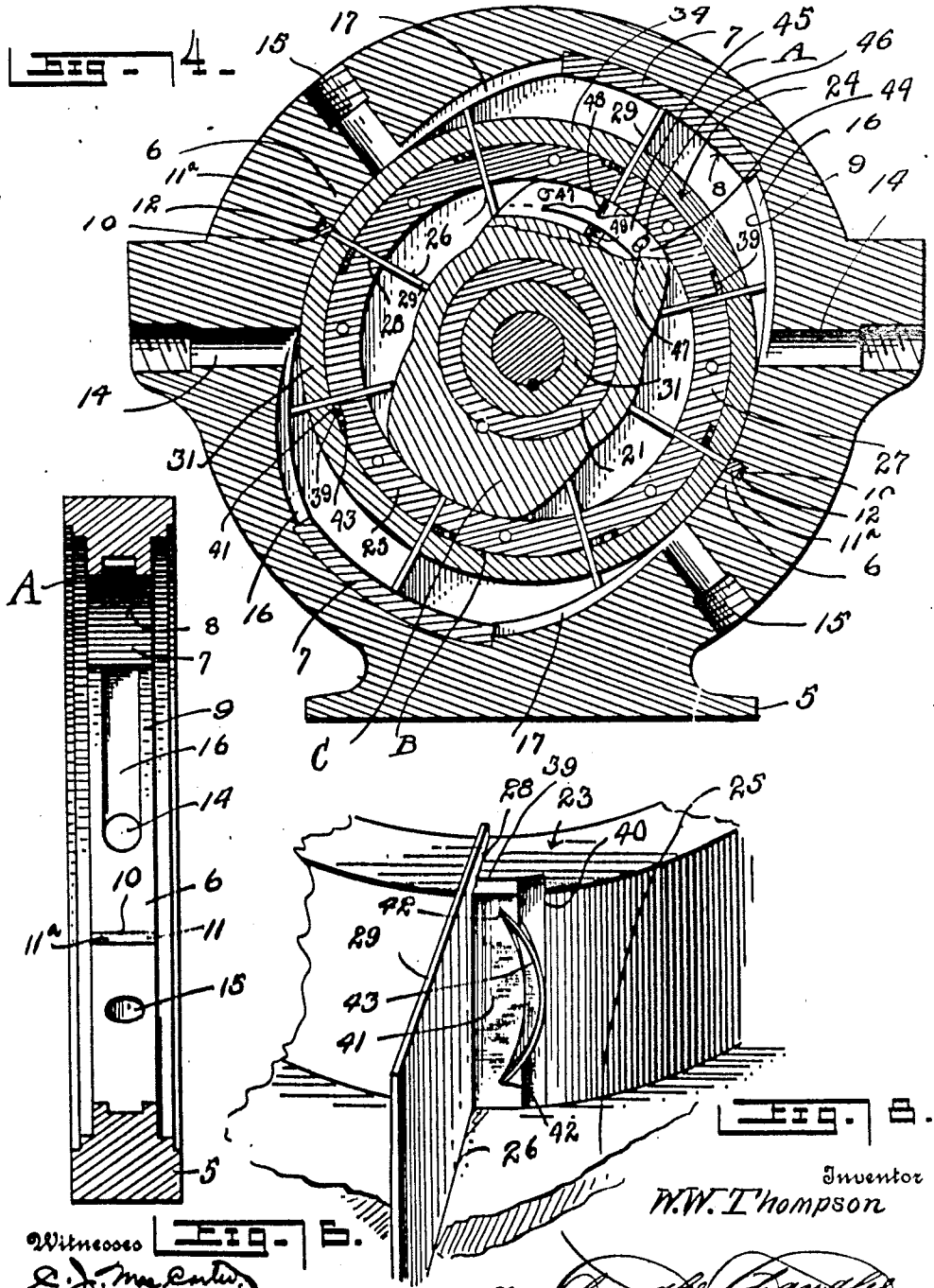
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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

1,058,496.

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Patented Apr. 8, 1913.

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To all whom it may concern:

Be it known that I, WINFIELD W. THOMPSON, a citizen of the United States, residing at Seebert, in the county of Pocahontas, State of West Virginia, 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.

This invention relates to improvements in rotary engines.

The principal object of the invention is to provide a rotor of novel construction for supporting a plurality of slidable pistons.

A further object of the invention is to provide a shell for engines of the character described which includes packing elements of novel construction which are engageable with the rotor to prevent the passage of steam during the rotation of the latter.

A still further object of the invention is to provide a rotary engine of the character described, which is composed of a relatively few number of parts, is therefore simple in construction, and is cheap to manufacture.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings: Figure 1 is a side elevation of an engine constructed in accordance with my invention, the outer section of the motor being removed to better disclose the piston-carrying section, Fig. 2 is an elevation of the inner face of the outer section, Fig. 3 is a cross sectional view through the engine, Fig. 4 is a longitudinal sectional view through the engine, Fig. 5 is a side elevation of the shell, Fig. 6 is a cross sectional view threethrough, Fig. 7 is a detail cross sectional view taken on the line 7-7 of Fig. 5 showing the spring actuated U-

shaped packing element, and Fig. 8 is a detail view showing a spring packing for one of the pistons.

Like reference numerals designate corresponding parts in all the figures of the drawings.

Referring to the drawings, the invention comprises a cylindrical body or shell A which is supported upon a base 5. This body includes opposed abutments 6-6, and between the abutments are disposed wear plates 7-7. The abutments 6 and wear plates 7 are of uniform widths, and are of less width than the width of the shell A to form opposed bearing surfaces 8-8. Each abutment 6 has its bearing surfaces 8 and wear face 9 centrally formed with a continuous slot 10 for receiving a U-shaped packing element 11. Disposed behind the connecting portion 11 of each element is a flat spring 12 which tends to normally urge said element inwardly. One end of one element 11 terminates in an outwardly directed stop lug 13 adapted for a purpose hereinafter described. Formed in the shell A on opposite sides of each packing element 11 and in spaced relation thereto are steam inlet and outlet ports 14 and 15 which respectively communicate with grooves 16 and 17 formed in the wear faces 9 of said abutments. Secured to the side faces of the shell A are opposed heads 18-18, and these heads are formed with concentric openings 19 forming bearings for receiving a shaft 20. Extending inwardly from one head 18 is a bearing 21 which is concentric with the opening 19 but of greater diameter than said opening. The outer end of the bearing 21 is enlarged to form a bearing 22.

My invention further comprises a rotor, which is designated as a whole by the reference letter B, and this rotor includes inner and outer sections 23 and 24 respectively. The inner section 23 consists of a flat ring 25 which is rotatably mounted upon the bearing 22 of the hub 21, and is disposed between the adjacent head 18 and the adjacent bearing surface 8 of the shell A. The inner face of the ring 25 is formed with a series of spaced radial grooves 26 which extend entirely across said ring. Extending inwardly from the ring 25 is a concentric

lateral flange 27 which is formed with a series of spaced slots 28 that register with the grooves 26, each groove 26 and slot 28 conjointly receiving a slidable piston 29, the length of each piston being less than the width of the ring 25. The outer section 24 of the rotor B comprises a disk 30 which is of the same diameter as the ring 25. This disk is positioned between the other head 18 of the opposite bearing surface 8 of the shell A. Extending inwardly from the disk is a hub 31 which is fixed upon the shaft 20 by any suitable means. This hub is rotatably mounted in the bearing 21, and is formed on its periphery with an oil groove 32. The inner face of the disk 30 is formed with a series of spaced radial grooves 33 which register with the grooves 26 of the ring 25 and serve to receive the inner edges of the pistons 29. Extending inwardly from the disk 30 is a lateral flange 34 which is concentric with the hub 31, and is formed with a plurality of slots 35 which respectively register with the grooves 33. The interior diameter of the flange 34 is slightly greater than the exterior diameter of the flange 27 of the ring 25, and the flange 34 is disposed around said flange 27, the slots 25 and 28 being disposed in registration to receive the piston 29. Disposed around the periphery of the ring 25 is a split packing ring 36, and disposed around the periphery of the disk 30 is a split packing ring 35', the ends of the latter being disposed on opposite sides of the stop lug 18 of the U-shaped packing element 30, said lug serving to prevent the rotation of said packing ring. The inner and outer sections 23 and 24 of the rotor B are secured together by means of screws 38 which pass through suitable openings formed in the disk 30 and enter threaded openings formed in the lateral flange 27 of the ring 25. The outer face of the flange 27 adjacent each slot 28 is formed with a transverse recess 39 forming a shoulder 40 which is disposed in spaced parallel relation to the piston 29. Disposed in each recess 39 is a packing plate 41, which is formed on its edge opposite the piston 29 with a dove-tailed recess 42. A flat bowed spring 43 is disposed within the dove-tailed recess 42 and bears against the shoulder 40 to yieldably hold the plate 41 against the piston 29.

Keyed upon the hub 21 and disposed within the lateral flange 27 of the ring 25 is an elongated cam C which is fixed to said bearing by any suitable means. The opposite ends of the cam are each formed with spaced longitudinal grooves 44—44. Crescent shaped wear plates 45—45 are respectively disposed within the grooves. Each wear plate is formed adjacent its ends with transverse slots 46. Pins 47—47 extend

through each end of the cam and through the respective slot 46 of the plates 45, and thereby permit of said plates moving outwardly for a limited distance. The opposed faces formed by each groove 44 are formed with opposed seats 48—48 for receiving a coil spring 49 which is disposed in rear of the respective plate 45 for yieldably urging said plate outwardly. It will thus be observed that the wear plates 45 are yieldably pressed outwardly for sliding engagement with the inner face of the flange 27 of the ring 25.

In operation, steam is admitted through either one or both of the inlet ports 14, and this steam will operate against the pistons 29, and thereby actuate the rotor B. As the rotor thus travels, the steam will be carried around between the respective pistons 29 and discharged through either one or both of the outlet ports 15 as the case may be. By employing two inlet and outlet ports, more or less pressure can be employed, or the engine can be reversed as will be readily understood by those skilled in the art. By positioning the wear plates 7 between the abutments 6, the end thrust of the pistons 29 at these points will be prevented from wearing the metal too fast. These wear plates being removable, can be readily replaced whenever so desired.

What is claimed is:

1. In a rotary engine a shell including opposed abutments, each abutment including opposed bearing surfaces and a wear face and having a centrally disposed continuous slot formed in said surfaces and face, and a U-shaped packing element mounted in each slot, the end of one element terminating in an outwardly directed stop element.
2. In a rotary engine, a shell including opposed abutments, a rotor including inner and outer sections mounted in the shell between the abutments, said sections being respectively formed with inner and outer inwardly extending concentric flanges, the flanges being respectively formed with a series of spaced radially extending registering slots, a hub projecting inwardly from the outer section, a cam fixed on the hub, spring pressed wear plates secured to the end of the cam and adapted to engage the outer flange, and pistons respectively mounted in the registering slots of the flanges and engaging the abutments and the cam.
3. In a rotary engine, a shell including opposed abutments, each abutment including opposed bearing surfaces and a wear face and having a centrally disposed continuous slot formed in said surfaces and face, a U-shaped packing element mounted in each slot, the end of one element terminating in an outwardly directed stop element, a rotor including inner and outer sections

mounted in the shell between the abutments, one of said sections including an inwardly extending hub, a cam fixed on the hub, a plurality of radially disposed pistons slidably supported by the sections intermediate the abutments and the cam, packing rings disposed around the sections, one of said rings being split and having its ends disposed on opposite sides of the stop of the

packing element, and opposed heads secured to the shell exteriorly of the sections.

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

WINFIELD W. THOMPSON.

Witnesses:

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HOMER G. BOBLETT.