

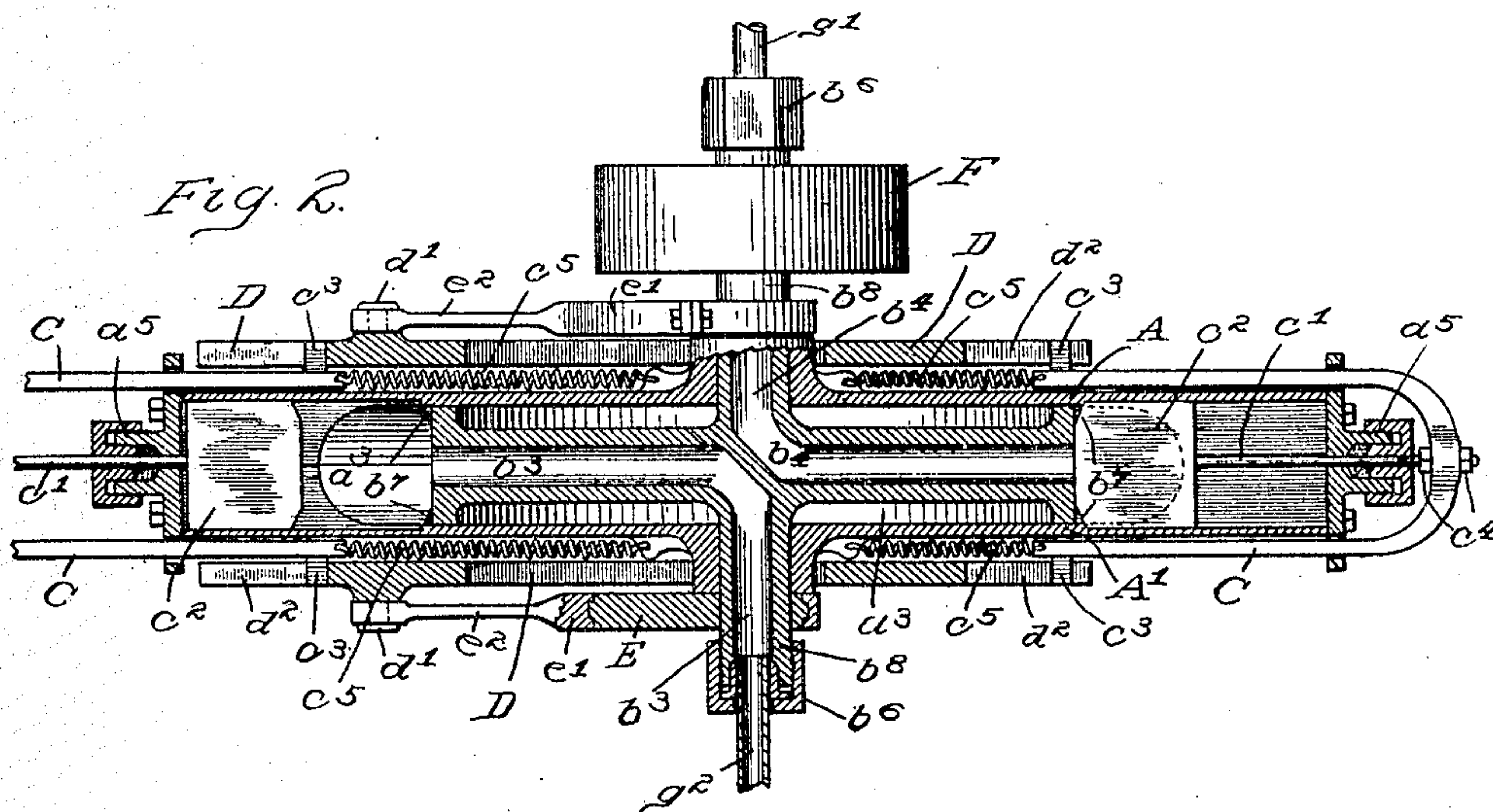
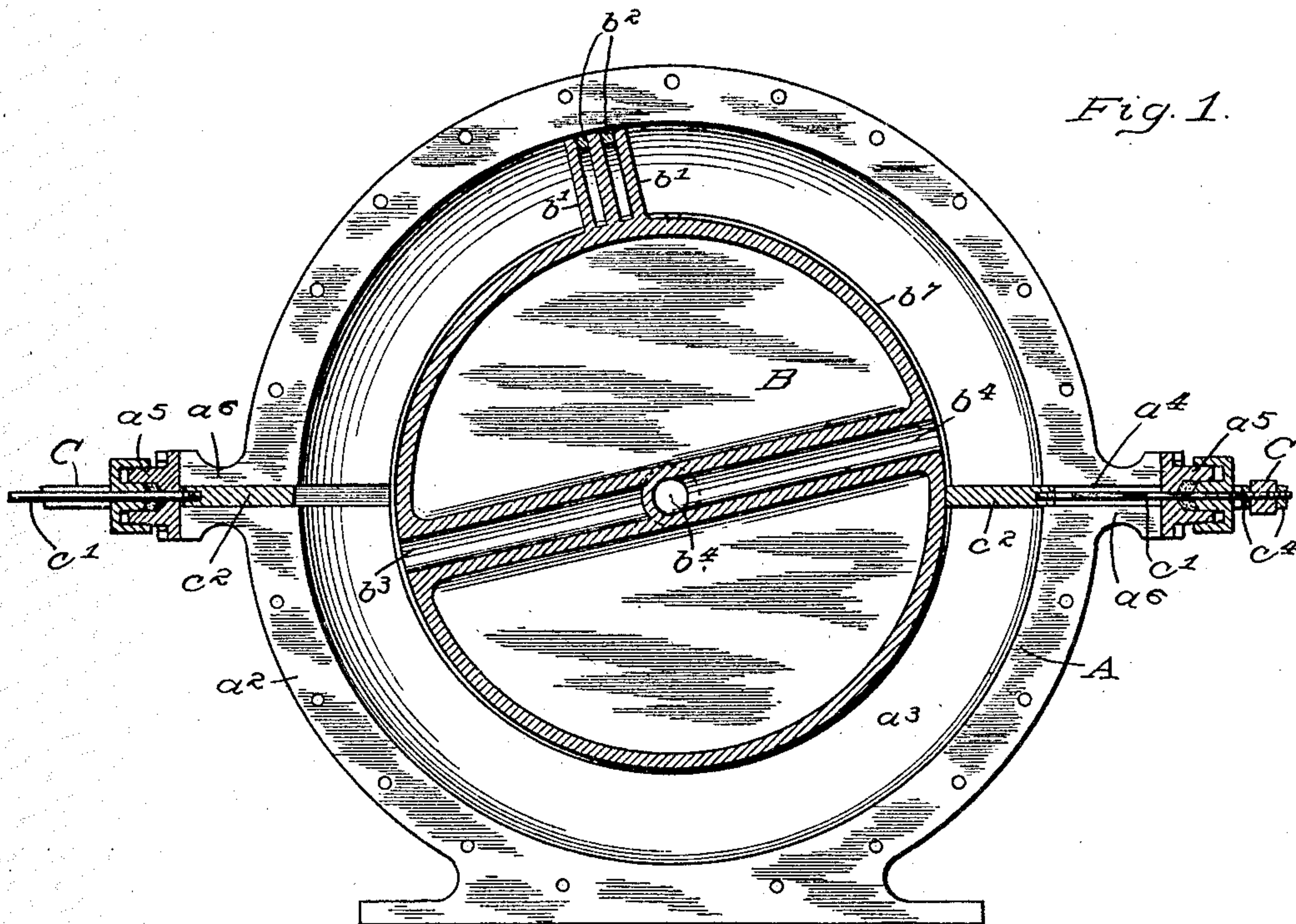
No. 860,549.

PATENTED JULY 16, 1907.

I. KLECKNER.  
ROTARY ENGINE.

APPLICATION FILED MAY 5, 1906.

2 SHEETS—SHEET 1.



Witnesses:  
John Braunnwalder  
M. A. Milord

Inventor:  
Ira Kleckner  
By  
Frederick Benjamin  
Att'y.

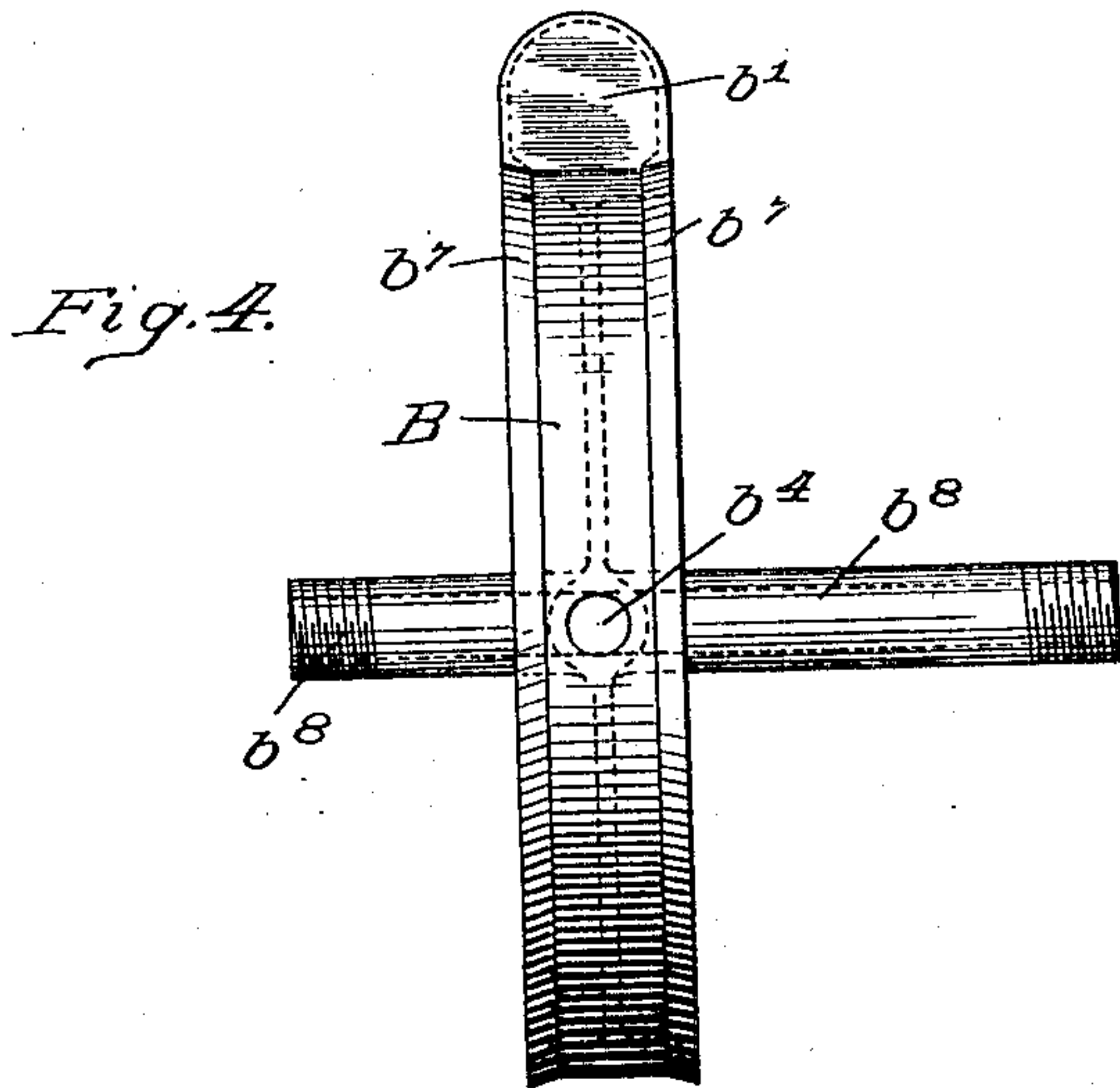
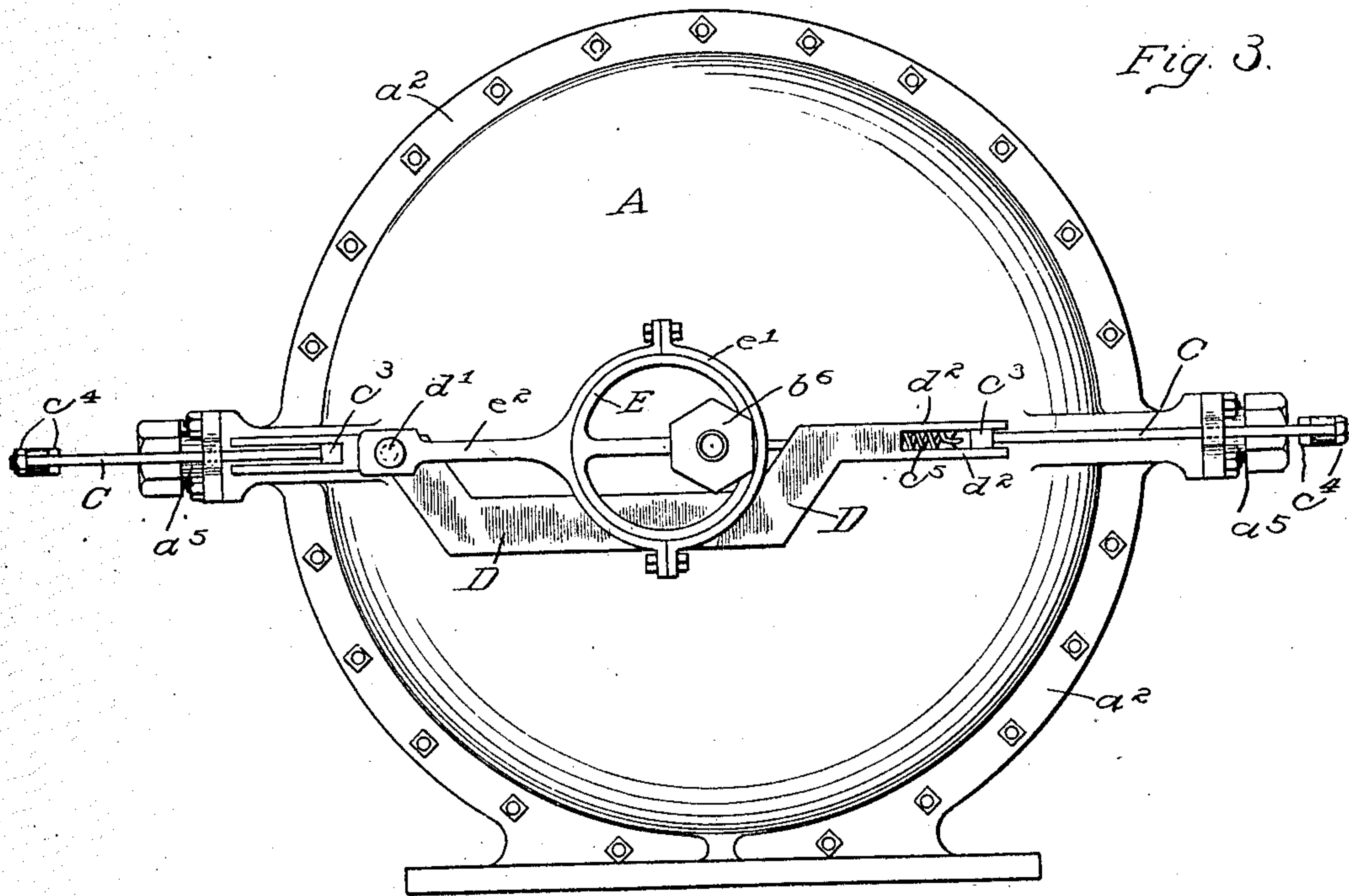
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# UNITED STATES PATENT OFFICE.

IRA KLECKNER, OF CAMDEN, INDIANA.

## ROTARY ENGINE.

No. 860,549.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed May 5, 1906. Serial No. 315,425.

*To all whom it may concern:*

Be it known that I, IRA KLECKNER, a citizen of the United States, residing at Camden, in the county of Carroll and State of Indiana, have invented certain  
5 new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to improvements in steam engines of the rotary type in which a cylindrical piston is mounted within and concentrically to a steam  
10 cylinder, and in which the steam enters the center of the piston on one side and passes out on the opposite side, and in which there are fixed and sliding abutments against which the steam impacts and rotates the piston.

15 The especial objects of my improvements, are to produce an engine of the type named which will be of simple and economical construction, in which the frictional surfaces will be reduced to the minimum and in which the expansive force of the motive power  
20 fluid will be conserved in the maximum degree.

The minor objects obtained through my improvements are the accurate movements of the sliding abutments and simple and effective provision for reversing the direction of the engine.

25 In the accompanying drawings which form a part of this application for patent, I have shown my improved rotary engine in the following views:—

Figure 1 is a vertical section through the center of the engine; Fig. 2 is a cross-section just above the  
30 horizontal axis of the engine; Fig. 3 is a side elevation of the engine, and Fig. 4 is an edge view of the piston.

Referring to the drawings in detail A, A<sup>1</sup>, represent the two cylinder plates which form the engine cylinder and the same are secured together by bolts  
35 through their co-registering flanges a<sup>2</sup>, leaving a cylindrical steam chamber a<sup>3</sup> having a rounded periphery as shown in Fig. 2. In this chamber is mounted concentrically with the cylinder, a hollow cylindrical piston B on the periphery of which are fixed radial  
40 abutments b<sup>1</sup>, b<sup>1</sup>, which are spaced apart and in the spaces therebetween, are loosely mounted expansive packing-rings b<sup>2</sup> which provide steam tight joints between the flanges b<sup>1</sup> and the inner walls of the cylinder. The piston is cast with steam passages b<sup>3</sup>, b<sup>4</sup>,  
45 which enter through the hubs b<sup>8</sup> of the piston, extend radially through the piston in opposite directions and pass out at opposite points in its periphery. These passages serve respectively and alternately as induction and eduction conduits and ports depending upon  
50 the direction in which it is desired to drive the piston. The cylinder plates are formed with extensions a<sup>6</sup> at opposite peripheral points to which are secured stuffing boxes a<sup>5</sup> of well known form. Through said extensions are slide-ways a<sup>4</sup> the inner ends of which communicate with the steam chamber a<sup>3</sup>. Arranged in  
55 the slide-ways a<sup>4</sup> are slidable abutments c<sup>2</sup> c<sup>2</sup> to the

outer edge of which are secured rods c<sup>1</sup>, c<sup>1</sup>, which pass through suitable openings in the stuffing boxes a<sup>5</sup> and have nuts c<sup>4</sup> mounted on their outer end-portions.

Secured to the rods between the nuts c<sup>4</sup>, are U-shaped  
60 yokes C the ends of which are connected with coil-springs c<sup>5</sup> which in turn have their opposite ends secured to lugs on the opposite faces of the cylinder as shown in Fig. 2. The normal tension of said springs is exerted to draw said yokes inwardly or toward the cen-  
65 ter of the cylinder and inasmuch as the sliding abutments are connected with said yokes through the rods c<sup>1</sup> the retractile power of the springs will be transmitted to said abutments.

Near the free ends of the yokes C are fixed square  
70 pins which are adapted to slide between the forked ends d<sup>2</sup> of the bars D arranged on opposite sides of the cylinder. Each of the bars D is formed with a boss d<sup>1</sup> near one end on which is pivoted the free end of the arm e<sup>2</sup> of the cam-ring e<sup>1</sup> which is fitted on the cam E.  
75 This cam is eccentrically mounted on the hub portion b<sup>8</sup> of the piston and rotates with the latter. A pulley F is mounted on one of the hubs of the piston, and steam is conducted to or from the passages b<sup>3</sup>, b<sup>4</sup>, by pipes g<sup>1</sup>, g<sup>2</sup>, between the ends of which and the said passages  
80 steam tight joints are effected by the stuffing boxes b<sup>6</sup> in the usual manner.

It will be understood from the foregoing description that the construction and arrangement of cam, cam-  
ring and bar D are the same on both sides of the cylin-  
85 der. It will also be understood that the sliding abutments are so mounted, connected and operated as to alternately close or block the steam chamber between the periphery of the piston and the walls of the cylinder.  
90

From the construction above described it will be apparent that steam entering through the pipe g<sup>1</sup> will pass through the passage b<sup>4</sup> and out at the periphery of the piston, whereupon the slidable abutment c<sup>2</sup> being  
95 across the chamber a<sup>3</sup> as shown in Fig. 1, the steam will impinge against the abutments b<sup>1</sup> of the piston and push same circumferentially of the cylinder and thereby rotate the piston; when the abutments b<sup>1</sup> pass the slide-way of the sliding abutment c<sup>2</sup> on the opposite  
100 side of the cylinder, the first named sliding abutment will begin to retract and thus will permit the steam to enter the passage way b<sup>3</sup> and pass therethrough and out the pipe g<sup>2</sup>, in the meantime, the supply of steam being continued, it will enter the space between the piston abutment b<sup>1</sup> and the second sliding abutment c<sup>2</sup>  
105 which will have been closed through the co-action of the cam E and its connecting rod D the yoke C and the springs c<sup>5</sup> as described, thus forming a second expansion chamber for the steam which will give further impetus to the piston and continue its rotation.  
110

I have not shown any means for reversing the introduction of the steam from the pipe g<sup>1</sup> to the pipe g<sup>2</sup>,



because any reversing slide valve arranged to control both of said pipes, will answer such purpose, and same forms no essential part of my invention which relates particularly to the construction of the engine proper.

5 Having thus fully described my invention what I claim as new and desire to obtain by Letters Patent, is:—

10 1. In a rotary engine, a cylindrical steam cylinder, a cylindrical piston having axial and radial passages there-through substantially as shown, and provided with fixed abutments on the periphery of the piston, slidable abutments mounted on opposite sides of the cylinder, U-shaped yokes connected with said abutments, and means for operating said yokes including spiral springs; substantially  
15 as described.

2. In a rotary engine, a cylinder, a cylindrical piston mounted within and concentrically to said cylinder and provided with axial and radial inlet and outlet passages, slideways in opposite sides of said cylinder, abutments

slidably mounted in said slide-ways, U-shaped yokes connected with said abutments, spiral springs connected with said yokes and adapted to retract the same, and eccentric means for moving said yokes against the tension of said springs. 20

3. In a rotary engine, a cylinder, a cylindrical piston 25 mounted within said cylinder and provided with communicating axial and radial inlet and outlet passages respectively, slide-ways in said cylinder, abutments slidably mounted in said slide-ways, yokes connected with said abutments, springs adapted to retract said yokes, and 30 means for moving said yokes against the tension of said springs consisting of cams cam-rings and slotted bars, substantially as described.

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

IRA KLECKNER.

Witnesses:

S. S. KLECKNER,  
J. C. SINK.