No. 876,763. PATENTED JAN. 14, 1908.

E. H. BARRETT.

ROTARY ENGINE.

APPLICATION FILED SEPT. 25, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

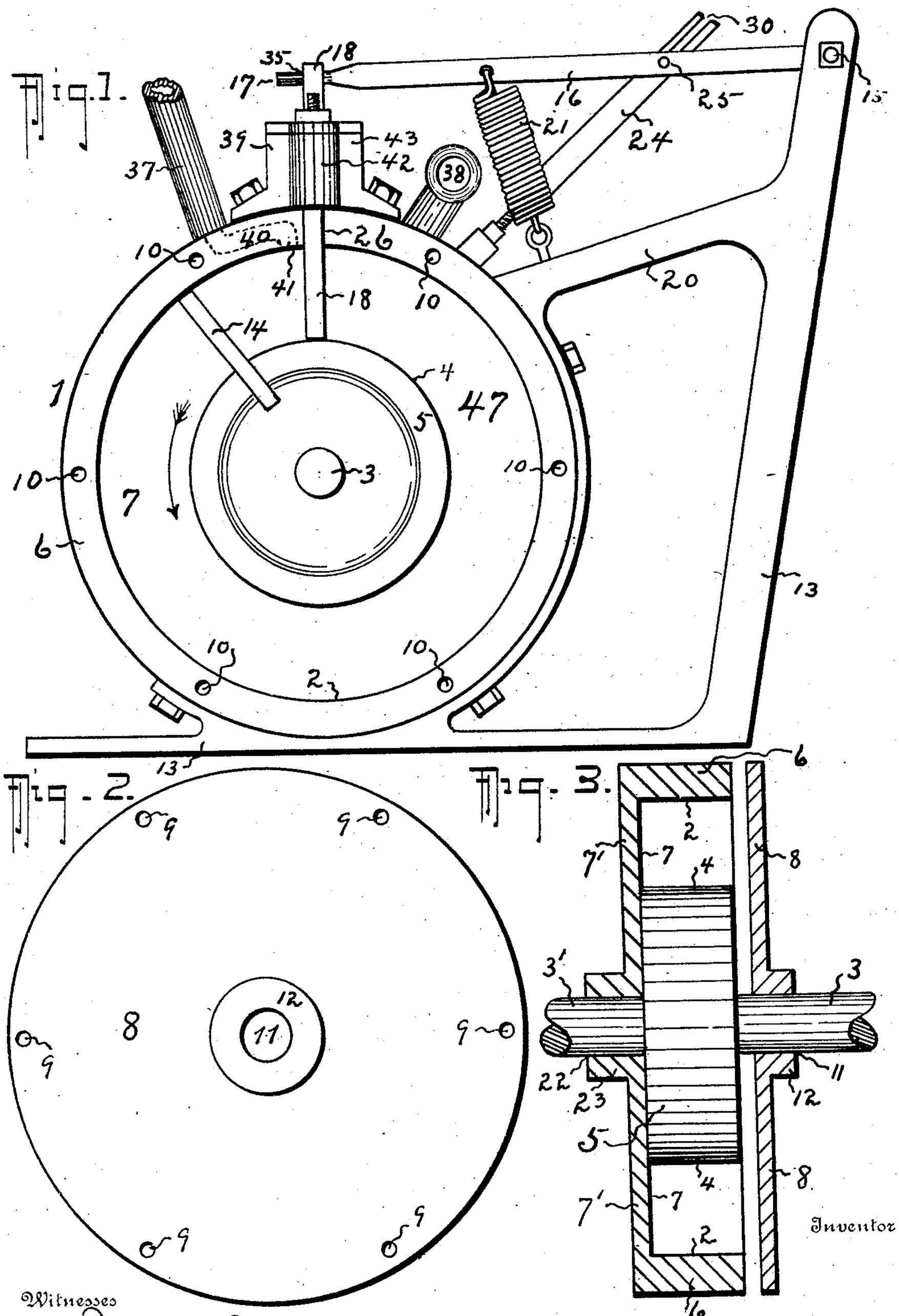

Fig. 2.

Fig. 3.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

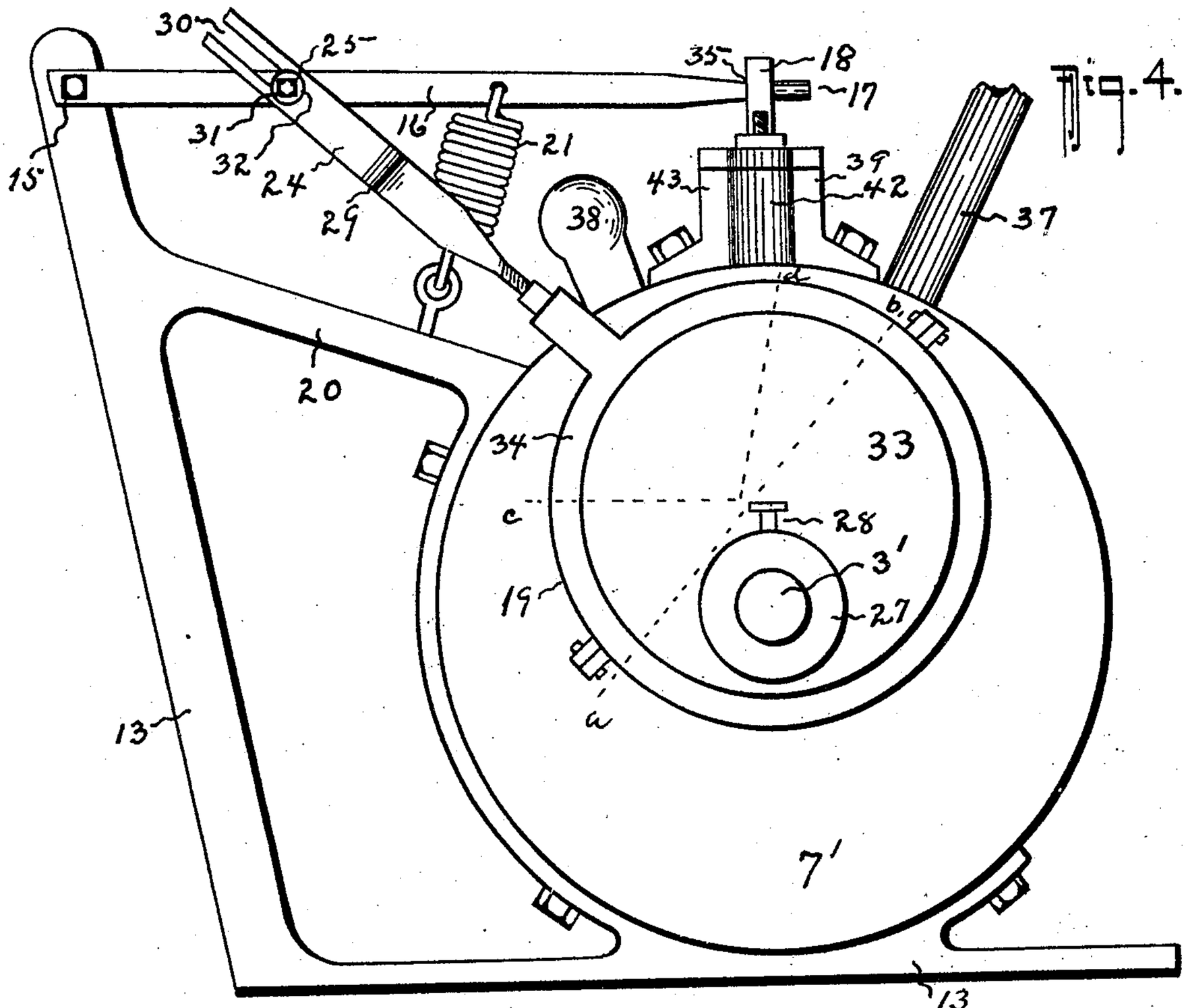


Fig. 5.

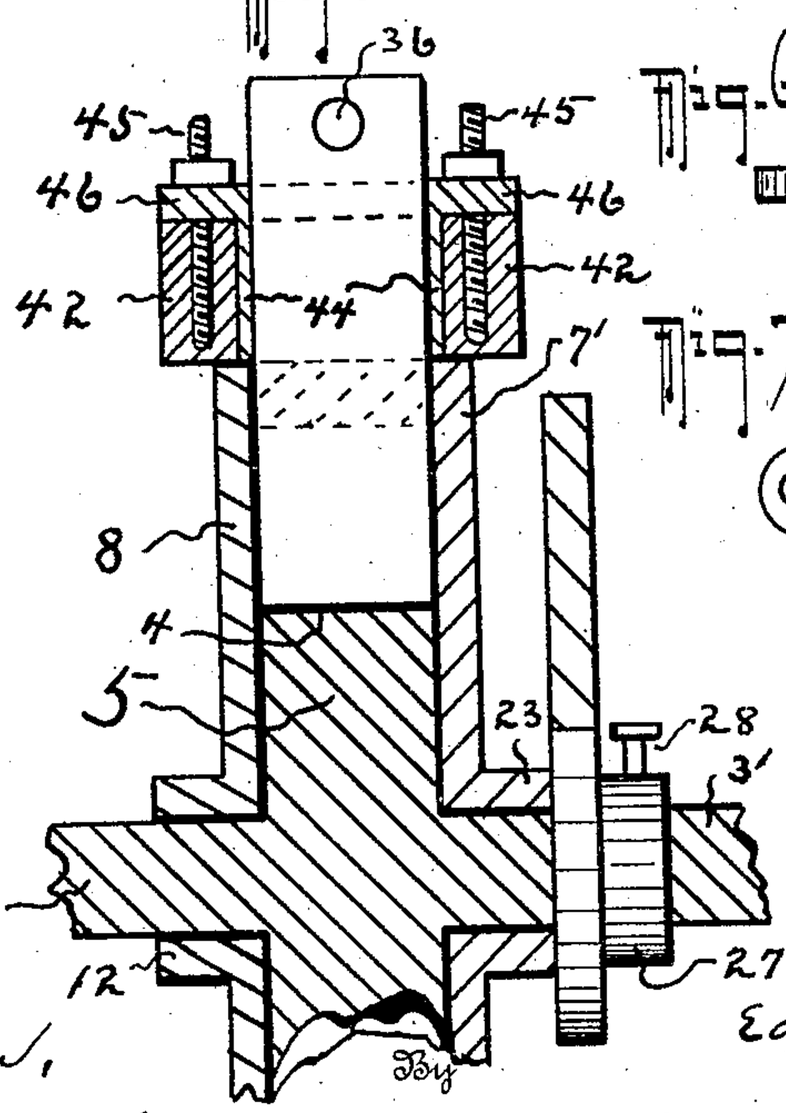


Fig. 6.

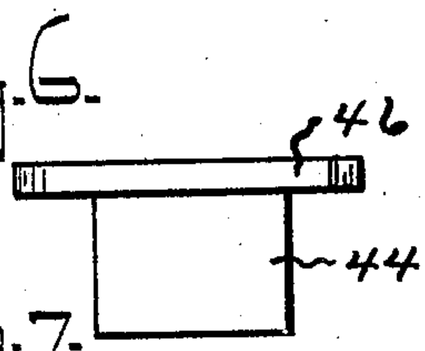


Fig. 7.

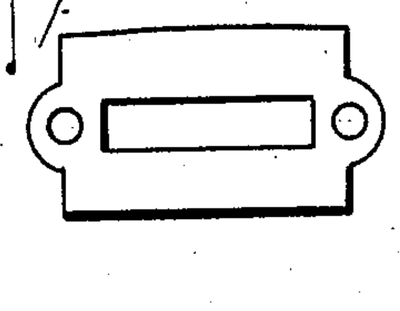
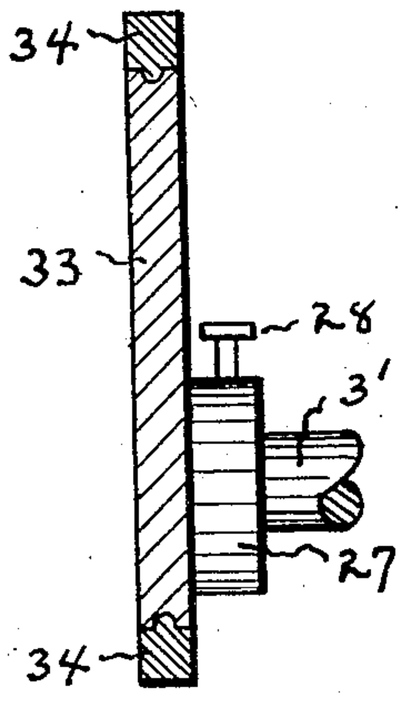


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

No. 876,763. Specification of Letters Patent. Patented Jan. 14, 1908.

Application filed September 25, 1906. Serial No. 336,124.

To all whom it may concern:

Be it known that EDWARD H. BARRETT, citizen of the United States, residing at Dunlap, in the county of Harrison and State of Iowa, has invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to improvements in rotary engines, and more particularly of the class designed for use in connection with steam as a driving force.

The primary object of the invention is the presentation of a means for economizing steam; another object is to produce a cylinder whereby a large volume of steam may be employed within a small space, which will be effective for the purposes designed.

The invention also has reference to certain features of compactness and economy of manufacture.

With these and other objects in view the invention presents a novel construction and arrangement of parts, as described herein and in the appended claims, and as illustrated by the drawings, wherein,—

Figure 1 is a vertical end or face view of the invention, showing broken-away intake pipe, the cover or end being removed. Fig. 2 is a face view of the cover. Fig. 3 is a view of the cylinder and cover sectioned centrally, also showing the central rotatable core, and broken-away shaft. Fig. 4 represents a rear view of Fig. 1, showing location of cam. Fig. 5 is a detail relating to Figs. 1 or 4, being partly in section, to illustrate the preferred construction for mounting and housing the sliding-plate for the cut-off valve, the view being on Fig. 4, looking to the intake-pipe, and showing the cam as sectioned on lines *c d* of Fig. 4. Figs. 6 and 7 are details relating to Fig. 5. Fig. 8 is a view of the body of the cam sectioned on line *a b* of Fig. 4.

Referring to the several figures of the drawings, the numeral 1 represents a steam box or cylinder having an inner, circular wall 2 of sleeve 6, equidistant from shaft 3 and the outer wall 4 of the circular core 5. Formed preferably integral with sleeve 6 is the transversely disposed cylinder end 7 having the face 7. I provide a cover 8 this being the opposite end, and when assembled, the cover is secured rigidly upon the chest or cylinder by means of bolts passing through openings 9 and 10 in a well known manner; a shaft aperture is formed in cover 8, the annular projection 12 being also provided. The cylinder walls may be cast in any foundry at small expense, the transverse wall 7 being considered one end and cover 8 the opposite end, and the cylinder may be secured stationary for operative uses upon any seating, as upon frame 13, by means of screw-bolts or otherwise.

The core 5 is preferably cast integrally with shaft 3, but this is not important provided it have a rigid mounting thereon, and it has a length equal to the length, transversely considered, of wall 2. The piston 14 consists of a leaf or blade secured rigidly within, and extends radially from, core 5 to wall 2 of sleeve 6, and has a width equal to the length of core 5, and as thus described it will be understood that, when these parts are assembled the cover 8 makes contact with the flat face of core 5 and with one of the edges of piston 14 and of sliding-plate 18, shaft 3 passing through opening 11; the contact of the cover with these parts, however, is not sufficiently close to produce any friction, or at least an impractical degree of friction; and as described it will be noted that a circular opening or trackway is created between wall 4 of the core and wall 2 of sleeve 6, this circular opening or recess being continuous, except the occupancy therein of the piston and sliding-plate.

Frame 13 is extended upward to provide a pivotal mounting at 15 for link 16, the latter having the free end 17 passing over the center of the cylinder, and seated upon link 16 adjacent to its free end is the sliding-plate 18 having a width equal to the width of piston 14; the sliding-plate is vertically disposed and traverses sleeve 6 transversely through aperture 26 formed in said sleeve. The sliding-plate is adapted to have a periodical sliding movement under operation of cam 19, and connecting parts, as will presently be explained, and operated in a manner so that it has a plunging movement within the cylinder, and a reverse movement, from wall 2 of the sleeve to wall 4 of the core portion. Link 16 is resiliently connected with arm 20, the latter being a part of frame 13, and this resilient connection may be by any suitable means, as the spring 21.

Corresponding to shaft 3 is shaft 3′ which extends from the rear of core 5, and, for purposes of description shafts 3 and 3′ may be considered trunnions of the core and a pre-

ferred construction would be to cast these parts integrally; aperture 22 (Fig. 3.) is formed transversely through the center of wall 7′; this opening is extended by means of the annular projection 23 which extends outwardly from wall 7′; shaft 3′ is seated in aperture 22, and, secured upon said shaft adjacent to projection 23, and substantially parallel with wall 7′ is cam 19. The cam is preferably formed with a collar 27 thereon, and by means of screw-bolt 28 is secured rigidly with the shaft, and has an arm 24 passing in a direction from its center outwardly and upwardly to a mounting at 25 upon link 16, presently to be described, this mounting being between the end-mounting 15 of the link and that of its free end; and as the cam does not occupy the same vertical plane as link 16, arm 29 has a convenient curvature at 27 so that its outer end may pass transversely to the link for its mounting at 25.

The outer end of arm 24 is provided with a lengthwise-extending slot 30, and familiar means are employed, as bolt 31, which is secured to link 16, washer 32 secured between the bolt-head and arm, and by these means arm 24 is adapted to have a well known, sliding movement, endwise upon bolt 31, when the cam is in operation.

A cam movement is so well known that it requires no description. When the shaft is rotated, disk 33 revolves, having shaft 3′ as its center of rotation; disk 33 rides within sleeve 34, and causes the sleeve and arm 24 to have an upward and downward movement, the arm 24, therefore, causing link 16 to have oa corresponding upward and downward movement; therefore, by means of the movement of the cam (Fig. 4), when shafts 3 and 3′ are rotated, sliding-plate 18, which has a mounting at 35 by the passage of link 16 through aperture 36 (Fig. 5.), is made to have a periodical sliding movement through aperture 26 (Fig. 1).

I provide the intake tube or pipe 37 and the exhaust pipe 38 which pass through the wall of sleeve 6 in close proximity to sliding-plate 18. Intake pipe 37 is seated closely adjacent to housing-bracket 39 and an aperture 40 is formed in sleeve 6 (Fig. 1.) and extended lengthwise from the seating of the intake pipe to its orifice 41 so that steam may be carried to a point as near sliding-plate 18, as possible.

Since the sliding-plate must have a width equal to the width of inner wall 2 of sleeve 6 I provide a construction which will overhang sleeve 6, for the housing of the sliding-plate, consisting of the outer sleeve 42 (Figs. 1, 4, 5) sustained upon the perimeter of sleeve 6 by means of housing-brackets 39 and 43, and seat the inner sleeve 44 within sleeve 42 and secure the union of these sleeves by screw-bolts 45 seated adjacent to the outer edges of the sliding-plate and passed through the flange 46 of the inner sleeve. By this construction the inner sleeve 44 operates to furnish a housing for and sustains the sliding-plate during its upward movement.

Since the parts have been quite fully described, operation will be readily understood. The parts being positioned as shown in Fig. 1, steam entering pipe 37 will cause piston 14 to be driven in the direction of the arrow, since the sliding-plate is in a closed position, and the piston is driven around the circular recess or chamber 47 toward the exhaust pipe 38, and just before reaching the sliding-plate, which up to that time was in a closed or lowered position, the sliding-plate under operation of the cam, is raised, which permits the piston to pass unobstructed, and after passing the plane occupied by the sliding-plate, the latter descends in a manner to confine the steam and to cause the force of steam to be exerted to propel the piston upon another rotation, thereby actuating core 5 and shaft 3. By the construction shown, the piston is driven in a continuous circular direction in a smooth, uninterrupted movement, nearly all of the steam being utilized, and a large volume of steam may be used within small compass. It will be noted that, by reason of the construction, core 5 performs the function of a balance wheel as well as furnishing one wall for the circular chamber 47; and by reason of employing the curved aperture within the wall of sleeve 6, steam may be carried in a manner to expend its force closely adjacent to the cut-off or sliding plate, which is considered an advantage, since it increases the space occupied by the steam within chamber 47.

It will be observed that the annular projections 12 and 23 (Fig. 5.) furnish bearings for shafts 3 and 3′; and the annular projection 23 furnishes a seating for the cam. Utilizing the means described, a pulley or gear wheel may be rigidly seated upon shafts 3 or 3′ to convey rotative movement for purposes of driving machinery, as is evident. After sleeve 6, the core portions and end parts have been cast, their surfaces which contact with the piston and sliding-plate are made smooth, as by planing, which is very easily accomplished; and thereby a very nice or accurate adjustment may be made so that the piston may have a close fitting. These cylinders have been made and tested, and prove to be quite inexpensive, comparatively, since the parts are few and within reach of any machinist.

What I claim as my invention is,—

A rotary engine, in combination, comprising a circular casing having inlet and outlet ports, a rotatable shaft provided with a core portion disposed centrally of the circular casing and having a cam mounted thereon, said core portion having a radially dis-

posed piston thereon; a sliding-plate mounted upon and traversing the circular casing, the link 16 having a pivotal end-mounting upon the frame and an opposite pivotal end-mounting upon the sliding-plate, the outwardly-extending recessed arm 24 of the cam slidably mounted upon the transverse arm 31 intermediate the ends of link 16, and the spring 21 connecting link 16 with the frame, substantially as described.

In testimony whereof he has affixed his signature in presence of two witnesses.

EDWARD H. BARRETT.

Witnesses:

ARTHUR STURGES,

HIRAM A. STURGES.