J. PLATT.

ROTARY ENGINE.

No. 34,981. Patented Apr. 15, 1862.

Fig 4

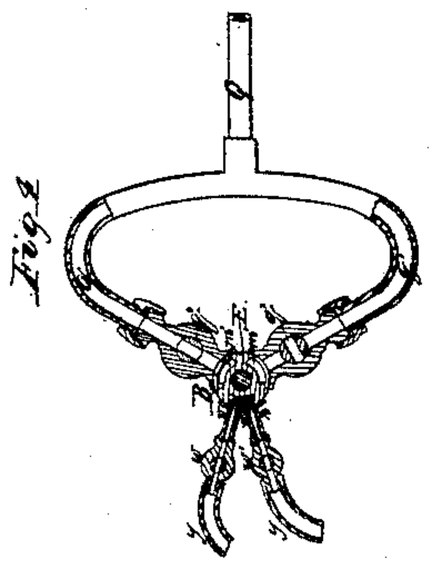


Fig 3.

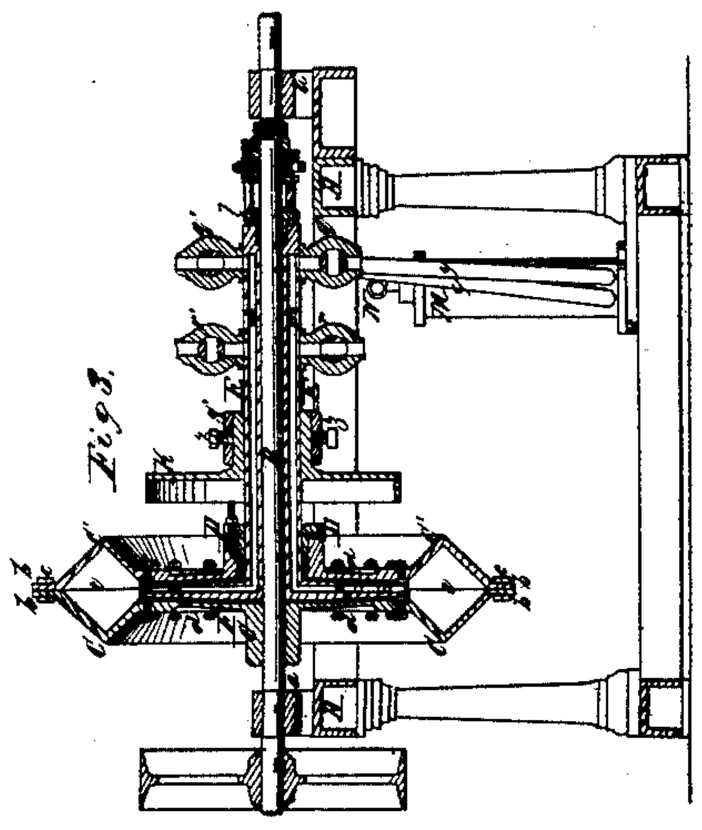


Fig 1

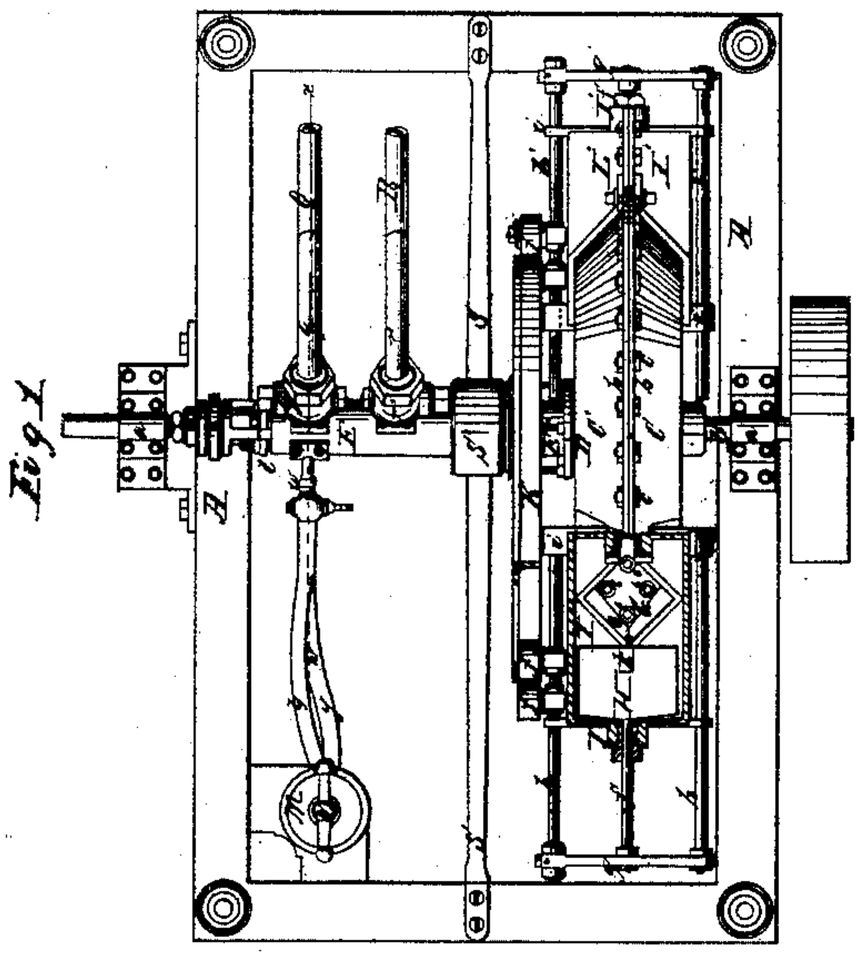
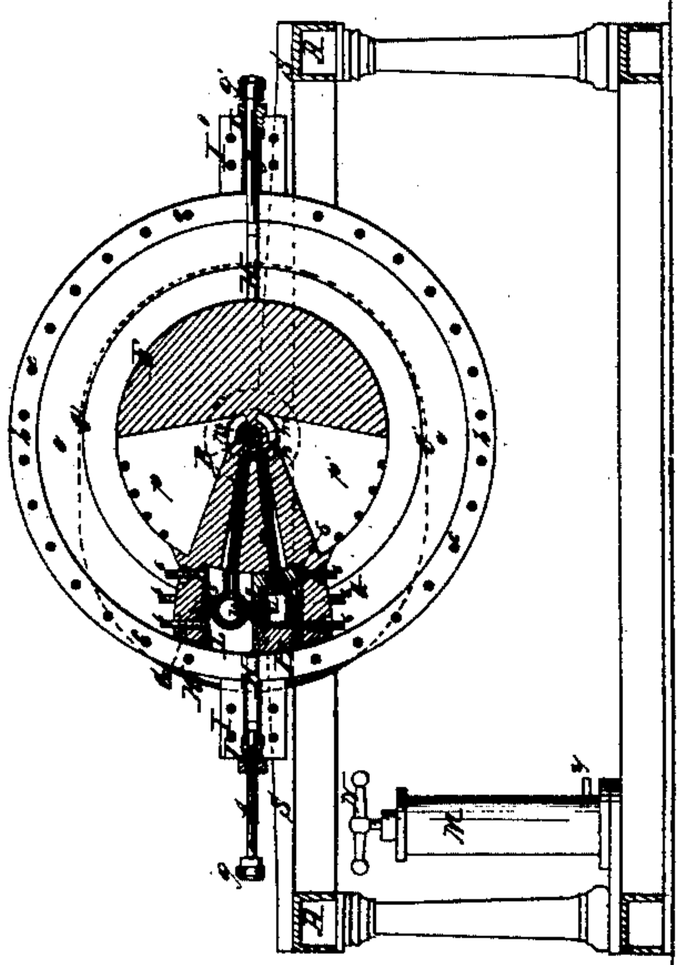


Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES PLATT, OF UTICA, NEW YORK.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **34,981**, dated April 15, 1862.

To all whom it may concern:

Be it known that I, JAMES PLATT, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top view, partly in section, of an engine with my improvements. Fig. 2 is a vertical section of the same perpendicular to its axis of rotation. Fig. 3 is an axial section of the same. Fig. 4 is a transverse section in the line *x x* marked on Fig. 1.

Similar letters and figures of reference indicate corresponding parts in the several figures.

This invention relates to rotary engines in which the cylinder rotates about a stationary abutment-head arranged within it.

It consists in a novel arrangement of induction and eduction pipes and passages to provide for the rotation of the engine in either direction.

To enable others skilled in the art to make and use my invention, I will proceed first to describe its construction and operation as a motor, after which a few remarks will explain its operation as a pump.

A is the framing of the engine, supporting the bearings *a a* of the main shaft B, to which the cylinder C C′ is firmly secured. This cylinder, which is concentric with the shaft, is divided in a plane perpendicular to the axis of the shaft into two equal parts C and C′, made with flanges *b b*, through which pass the bolts *c c*, which secure the two parts together. The shaft passes right through the cylinder, the part C of which is keyed or otherwise secured firmly to the shaft; but the part C′ is bored centrally much larger than the shaft and fitted with a stuffing-box D, through which passes the stationary hollow shaft or sleeve E, which carries the stationary abutment-head F, arranged within the cylinder. This head consists of a disk of metal of no greater thickness than is absolutely necessary for the support of the abutment, and the portion *d d* of the cylinder in which the said head is received is only just wide enough for its reception and much narrower than the portion *e e* farther from the axis, in which the steam acts and to which the abutment G is fitted. The object of thus contracting the width of the abutment-head and cylinder between the abutment and shaft is to reduce the lateral pressure upon the shaft, which is so detrimental to the wear of rotary engines, such reduction being effected by allowing the steam to act in a direction to produce such pressure upon but a very small surface—viz., the narrow edge of the disk. The portion *e e* of the cylinder may be of various forms in its transverse section, the abutment being of course of corresponding form. The form represented is nearly a square, one of the angles being next the edge of the disk or head F.

H H′ are the pistons, working radially within and rotating with the cylinder. These pistons are parallel-sided and are fitted into slots cut right through the sides of the portion *e e* of the cylinder radial to the center thereof, but are inclosed by piston-boxes I I′, bolted to and extending partly along the side of the cylinder, as shown in Fig. 1. The said pistons are furnished with piston-rods *f f′*, which work through stuffing-boxes J J′ in the boxes I I′, and the said piston-rods have secured to them cross-heads *g g′*, to the ends of which are attached guide-rods *h h h′ h′*, working through guides *i i* on the sides of the boxes I I′, and to one of the guide-rods belonging to each piston there are attached two friction-rollers *j j*, to work on the inside and outside of the laterally-projecting rim of a stationary cam K, which is keyed or otherwise firmly secured to the stationary hollow shaft or sleeve E, which carries the abutment-head F, the said cam being of such form that it will hold each piston stationary in relation to the cylinder and in contact with the edge of the abutment-head during that half of its revolution farthest from the abutment and draw it out far enough to pass the abutment previous to its arrival thereat and force it in again to the abutment-head after passing. The cam K and the hollow shaft or sleeve E are kept in a stationary position by means of a bar S, which is bolted to opposite sides of the frame and which has formed in it a band or socket S′ for the reception of the hub of the cam, which is secured therein by one or more set-screws Z Z or a key. The pistons are packed

with spring-packing *k*, to work in contact with the edge of the abutment-head, and, being well supported against the pressure of the steam on the front face of the slot in the cylinder, will make a steam-tight joint with the said face.

The stationary hollow shaft or sleeve E of the abutment-head is fitted at the end farthest from the cylinder with a stuffing-box *l*, which prevents any escape of steam round the main shaft B. The said shaft or sleeve E contains three passages *m*, *m'*, and *n*, extending nearly its whole length, of which the two *m m'* are induction and eduction passages leading to passages *p p'* in the abutment-head, which communicate with the steamway *e e* of the cylinder on opposite sides of the abutment, and the third *n* is for a purpose to be hereinafter specified. The pistons will be caused to move from the abutment in one direction or the other, according to which side of the abutment the steam is admitted to the cylinder, and by the movement of the pistons the rotary motion of the cylinder and shaft is produced. The passages *m m'* have each attached to them one of two branches *q q'* of the induction-pipe Q and one of two branches *r r'* of the eduction-pipe R. The several branches *q q'* and *r r'* are provided with separate cocks *q* q'* r* r'** By opening *q** and *r'** and closing *q'** and *r** the cylinder and shaft are caused to rotate in one direction, and by opening *q'** and *r** and closing *q** and *r'** they are caused to rotate in the opposite direction. This system of reversing is similar in principle to what has been used in rotary engines with stationary cylinders, but in this engine is differently applied.

To insure the perfect working of the engine, it is very necessary that the abutment should be well packed. To effect this, I provide in the solid portion of the abutment a cavity for the reception of two packing-blocks L L', of brass or composition metal, each of which is divided centrally, or nearly so, into two pieces, each of which is bored for the reception of a portion of a short tube *s* of metal, the division of the upper block being in a direction parallel with the planes of revolution, and that of the lower one in a direction transverse thereto, as illustrated in Fig. 2. Within each tube *s* is arranged a bag *u*, of elastic vulcanized india-rubber, and from the two bags *u u* tubes *v v*, of india-rubber or gutta-percha, extend through the backs of the packing-blocks and through a cavity *t*, provided for the purpose in the abutment-head F, and through the passage *n*, before mentioned, in the stationary shaft or sleeve E of the abutment-head. These tubes connect with cocks *w w*, secured to the outside of the hollow shaft or sleeve, and these cocks are connected by tubes *y y* with a close cylinder M, fitted with a piston worked by a screw N. This cylinder contains air or other fluid, which is forced by screwing down the piston within it through the tubes *v v*, cocks *w w*, and tubes *y y* into the bags *u u*, and so caused to expand the bags between the two portions of their respective packing-blocks and make them press out the blocks against the interior of the cylinder. The pressure thus applied to force out the packing may be regulated by the screw N. Between the solid portions G G of the abutment and the packing-blocks there are arranged plates 5 5, which are held against the blocks L L' by set-screws 6 6, screwing through the solid portions of the abutments.

The revolving cylinder of this engine may be inclosed in a stationary case or shell.

To use the engine as a pump, it is only necessary to apply power to the shaft to turn the cylinder in the proper direction, according as *p* and *p'* are induction or eduction passages, and water is caused to enter the cylinder in rear of the pistons and be discharged therefrom in front of them.

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

The arrangement, in combination with the rotating cylinder, the stationary abutment-head, and hollow stationary shaft E, of the two branched induction and eduction pipes Q *q q'* and R *r r'* and cocks *q* q'** and *r* r'**, communicating with the separate passages *m m'* of the hollow stationary shaft, all substantially as and for the purpose herein set forth.

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Witnesses:
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