(No Model.)

C. H. CARY.

ROTARY ENGINE AND PUMP.

No. 346,721. Patented Aug. 3, 1886.

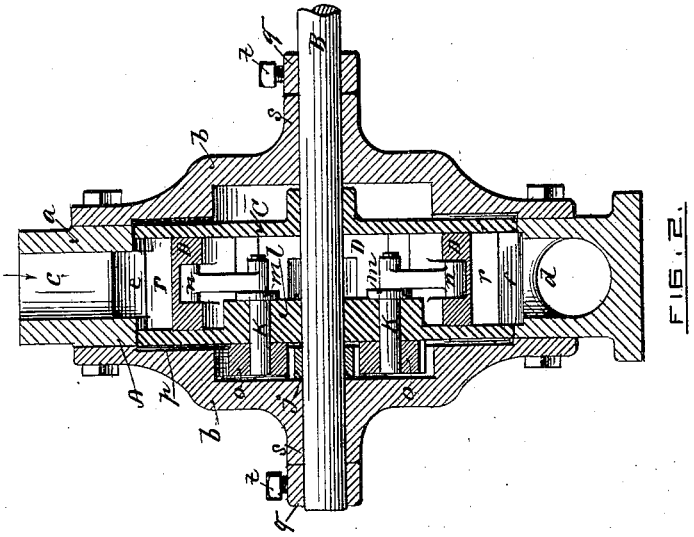

FIG. 2.

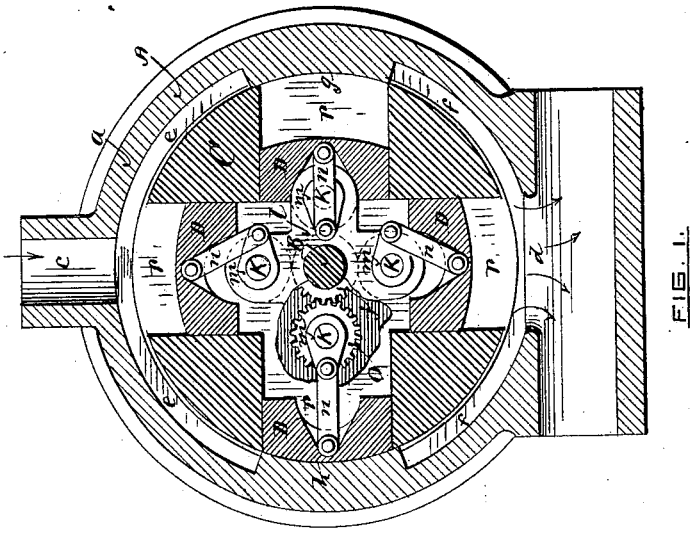

FIG. 1.

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CHARLES H. CARY, OF BRISTOL, RHODE ISLAND.

ROTARY ENGINE AND PUMP.

SPECIFICATION forming part of Letters Patent No. 346,721, dated August 3, 1886.

Application filed August 28, 1885. Serial No. 175,601. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. CARY, of Bristol, in the county of Bristol and State of Rhode Island, have invented a new and useful Improvement in Rotary Engines or Pumps, of which the following is a specification.

My invention relates to that class of rotary engines or pumps in which a rotary head revolving between opposite abutments is provided with reciprocating pistons which operate within radial piston-chambers formed in the rotary head; and it consists in the conically protuberant form of the face of the pistons, the conically-beveled construction of the fitting surfaces of the rotary head and outer case, and adjusting means whereby the proper joint-tightening adjustment may be readily effected, and in the improved combination of the rotary head and its reciprocating pistons with gearing adapted to cause the proper coincident action of the reciprocating pistons and rotary head, as hereinafter fully set forth.

Figure 1 is a transverse vertical section of one form of my improved rotary engine or pump, a small portion of the rotary head being broken away in order to show the connection of the gears. Fig. 2 is an axial vertical section of the same.

In the accompanying drawings, A is the outer case of a rotary engine or pump, which consists of the conically-bored central rim, *a*, and the two heads *b b*, which are removably secured to the sides of the rim. The rim *a* is provided with the openings *c* and *d*, and also with the passages *e* and *f*, between which are located the diametrically-opposite abutments *g* and *h*. The heads *b b* serve for the bearings of the shaft B, upon which is secured the rotary head C, the periphery of the said head being made in conical form to fit the conical bore of the outer case. The rotary head C is provided with four radially-directed piston-chambers, *r r r r*, the opposite abutments *g* and *h* being made slightly longer on their curved faces than one-eighth of the circumference of the rotary head, the extent of the openings of the chambers *r* in the line of the circumference of the head being in this case preferably made equal to forty-five degrees. The gear *j* is bored out to receive the shaft B, and is secured to the adjacent removable head *b*, so as to be held stationary, while the rotary head C and shaft B revolve. The shafts K K, which pass through bearings made in the thickened portion *l* at one side of the rotary head C, are provided at their inner ends with the cranks *m*, from which connection is made to the pistons D by means of the connecting-rods *n*. Upon the outer ends of the shafts K are secured the gears *o*, which in this instance are made equal in size to the central stationarily-held gear *j* and engage with the same, so that a pressure imparted inward movement of the pistons will, by the resulting revolutions of the cranks *m* and gears *o*, cause a continuous rotary movement of the head C, the steam or other fluid from which the piston movement is derived passing in at the opening *c*, and passing out at the opening *d*.

When the gear *j*, instead of being made of the same size as the gears *o*, is made twice the size of the same, the rim *a* will be provided with four abutments instead of two, the abutments and piston-chambers being reduced to one-half their former circumferential extent with duplicate and oppositely-located receiving and exhausting openings, and by this means the pressure upon the revolving head may be balanced, thus improving the action of the engine, but the principle involved will remain the same.

A sufficient space, *p*, is left between the smaller side of the rotary head and the adjacent removable head *b* of the outer case to provide for proper adjustment in tightening the joint between the periphery of the rotary head and the conical bore of the rim *a*. This adjustment may be effected by means of various devices, and in this instance I have provided the collars *q q* upon the shaft B at the outer ends of the hubs *s* of the removable heads *b b*, so that by the proper adjustment of the said collars by means of their set-screws *t* the conically-inclined periphery of the rotary head C may be tightly adjusted to the rim *a*.

I do not in this application make special claim to the employment of the opposite abutments, the rotary head, and the pistons having protuberant faces, as the same has been claimed by me in application Serial No. 151,232, filed December 26, 1884.

I claim as my invention—

1. The combination of the opposite abutments of the outer case, the rotary head fitting between the said abutments and provided with radially-directed piston-chambers, the pistons adapted to reciprocate within the radial chambers of the rotary head, the stationary gear, and the revolving gears engaging with the stationary gear, and operatively connected with the reciprocating pistons, substantially as described.

2. The combination of the conically-beveled opposite abutments of the outer case, the conically-formed rotary head fitting between the said abutments and provided with radially-directed piston-chambers, and the pistons conically beveled upon their outer faces and adapted to reciprocate within the radial chambers of the rotary head, substantially as described.

3. The combination of the conically-beveled opposite abutments of the outer case, the conically-formed rotary head provided with radially-directed piston-chambers and adapted for axial movement within the case, the pistons conically beveled upon their outer faces and adapted to reciprocate within the radial chambers of the rotary head, and means for adjusting the conical rotary head in the line of its axis, substantially as described.

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Witnesses:
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