No. 625,731. Patented May 30, 1899.

H. H. AMES.

ROTARY ENGINE.

(Application filed Jan. 18, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

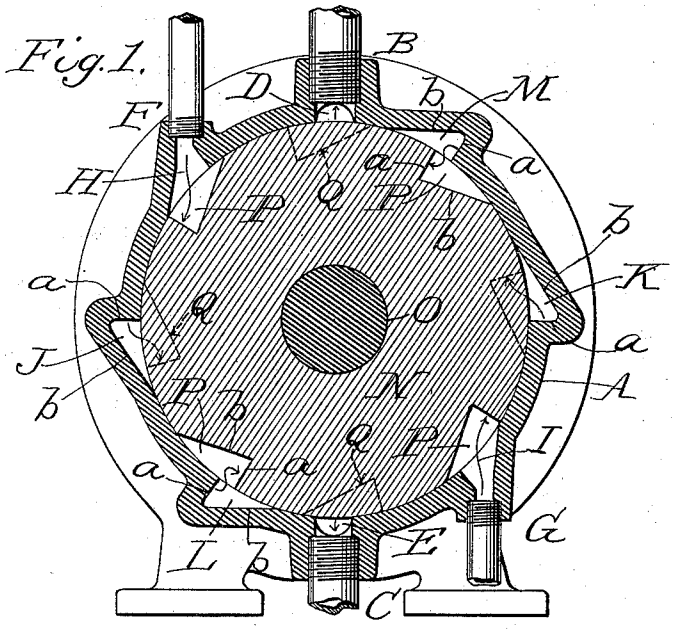


Fig. 2.

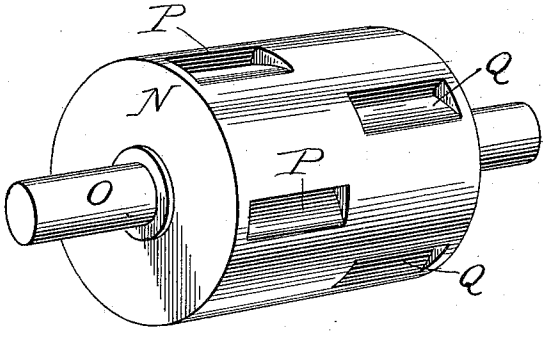
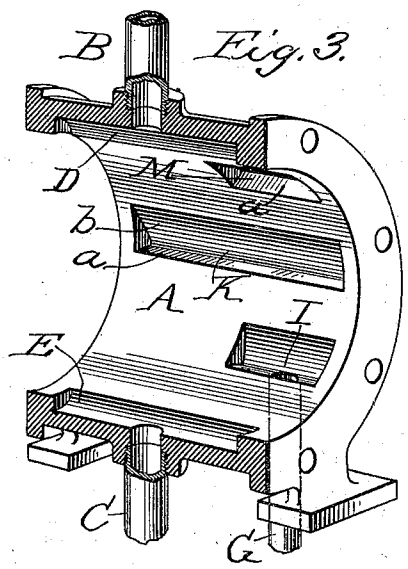


Fig. 3.



Witnesses
W. C. Burdine
D. E. Burdine

Inventor:
Hannibal H. Ames,
by Dodger Sons,
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 625,731. Patented May 30, 1899.

H. H. AMES.

ROTARY ENGINE.

(Application filed Jan. 18, 1897.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

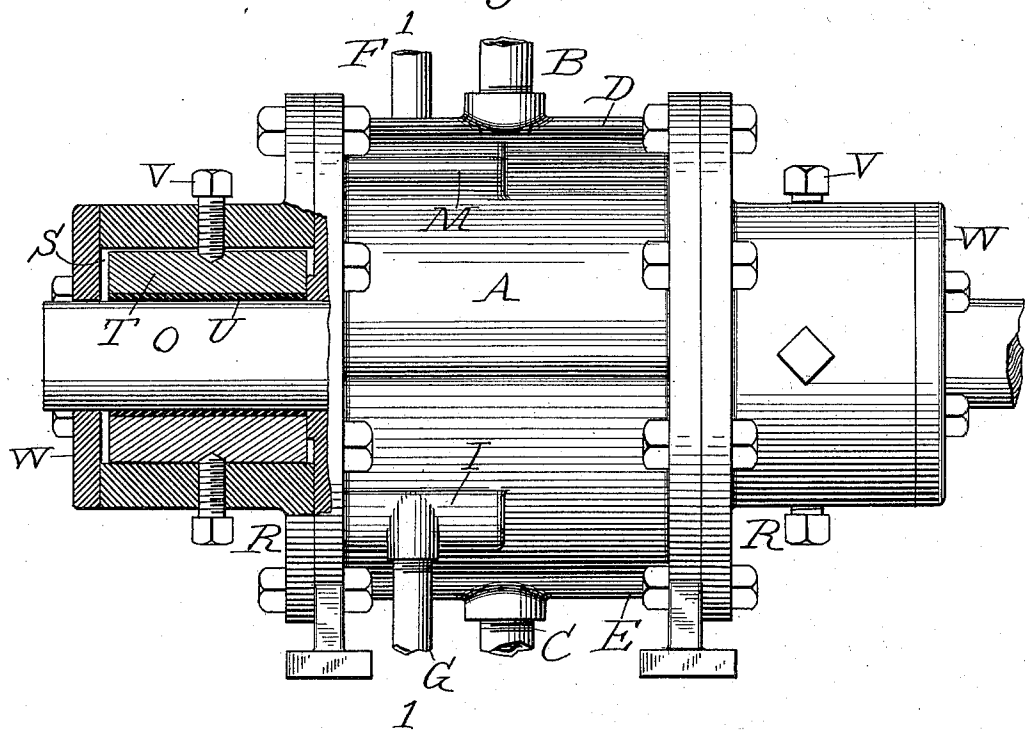
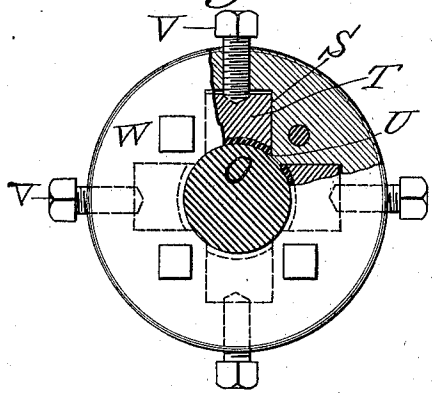


Fig. 5.



Witnesses;
C. C. Burdine.
D. E. Burdine.

Inventor;
Hannibal H. Ames,
by Dodge & Sons,
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HANNIBAL HAMLIN AMES, OF HUTCHINSON, MINNESOTA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 625,731, dated May 30, 1899.

Application filed January 18, 1897. Serial No. 619,560. (No model.)

To all whom it may concern:

Be it known that I, HANNIBAL HAMLIN AMES, a citizen of the United States, residing at Hutchinson, in the county of McLeod and State of Minnesota, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My present invention pertains to rotary steam-engines, the advantages and construction of which will be hereinafter set forth, reference being had to the annexed drawings, in which—

Figure 1 is a cross-sectional view of the engine, taken on the line 1 1 of Fig. 4; Fig. 2, a perspective view of the interior drum or cylinder; Fig. 3, a perspective view of a portion of the casing, showing the interior construction of the same; Fig. 4, a side elevation of the engine, partly in section; and Fig. 5, an end view of a portion of the engine.

The object of my invention is to economize in the use of steam, utilizing it both at boiler-pressure and expansively; also, to apply the steam to the rotative member in such manner that all side pressure will be obviated and that said member will be held in or surrounded by an atmosphere of steam.

By the arrangement and relation of the parts now to be set forth the objects are accomplished.

In the drawings, A denotes the central portion of the casing or frame of the engine, said casing being in its general contour circular in cross-section. At diametrically opposite points, preferably at the top and bottom of the casing, I provide exhaust outlets or ports B and C. The exhaust-ports are arranged about the center of the casing and open into pockets or recesses D and E, formed in the side thereof. These pockets or recesses extend the entire length of the central casing or frame, or approximately so.

F and G indicate the steam inlets or ports, which, like the exhaust-ports, are preferably placed at diametrically opposite points. It will be noted upon reference to Figs. 1 and 4 that these inlet-ports are to one side of the center of the casing and that the chamber or pockets H and I, formed in the casing and with which they communicate, extend slightly less than half the length of the casing. Both of them are, however, located upon the same side of the center. It will also be noted that the steam inlets or ports are set tangentially to the interior of the casing or to the rotative member. At a point below the pocket H and at a similar point above the pocket I are formed the pockets or recesses J and K. These pockets extend approximately the entire length of the casing and are formed as shown—that is, with an abutment or shoulder *a* and an inclined side *b*, which merges gradually into the general cylindrical line of the interior of the casing. Below the pocket or recess J and above the pocket K are formed short pockets or recesses L and M, the contour or form of these pockets being the same as that of the pockets J and K—that is, they have the abutment or shoulder *a* and the inclined side *b*. The length of these pockets corresponds to the length of the pockets or recesses H and I, and they are directly in line therewith.

N denotes the rotary member, cylindrical in general contour and turned to fit accurately within the casing aforesaid. A shaft O extends through and is made fast to the member N and is journaled in suitable bearings, to be hereinafter described, or, if desired, the cylinder and shaft may be formed integral.

In the face of the cylinder I form two series of pockets, each series occupying a position on opposite sides of the center of the cylinder. P denotes one series, those directly in line with the steam-inlets and upon which the steam acts with an impact at boiler-pressure. The second series Q alternate in position with the pockets P and are designed to be acted upon by the steam in an expansive manner. It will be noted that the pockets P and Q are given the same form as the pockets in the casing, but that the relative position of the sides is reversed.

To each end of the central portion of the casing are secured bonnets or heads R, which are bolted directly to flanges formed on the ends of said central section. Within the bonnet or head are formed four ways S, in which are mounted blocks T, provided with suitable curved bearing surfaces or faces U, which form the journal for the shaft O. Adjusting bolts or screws V are mounted in the bonnet and bear directly upon the blocks T, so that

any wear may be compensated for and the shaft and the rotary member N may be kept in proper alinement with the casing. Cap-plates W are secured to the end of the bonnets or heads, forming a neat finish and preventing the oil from escaping from the journals.

Assuming the parts to be in the relation shown in Fig. 1, the operation of the engine is as follows: Steam is admitted simultaneously through the steam-inlets F and G into the pockets H and I. Two of the pockets P P are then opposite the pockets H and I, and the steam acting with impact at boiler-pressure against the shoulder or abutment of said pockets P will cause the cylindrical member N to rotate. The pockets P thus filled with steam will pass around until they come into alinement with the long pockets J and K and the steam will pass into said pockets. Thus a quick exhaust is obtained for the pockets P, which of course materially assists in the free running of the engine. A further rotation of the cylinder will cause the pockets to pass beyond the pockets J and K, leaving a certain amount of steam therein, which will pass into the pockets Q, which then come into communication therewith. At the same time other pockets P of the series are brought into position to be acted upon directly by the steam at boiler-pressure. The pockets P and Q exhaust into the channels D and E, which, as before stated, are in communication with the exhaust-pipes B and C. From the foregoing it will be seen that the pockets P receive the steam at boiler-pressure and utilize the same in the first instance by impact. The steam which they carry on is then allowed to pass into a pocket or channel common to both the pockets P and the pockets Q, and, finally, any remaining steam which they contain is used expansively in connection with pockets L and M.

It is to be noted that at no time are the pockets or chambers P and Q in communication with the chambers J and K at the same instant.

Under the construction and operation as above set forth it will be seen that there can be no side thrust upon the rotating member.

Under some conditions—as, for instance, in running with a light load—it may be desirable to use only one steam-inlet and one exhaust-port, in which case the exhaust-channel D or E, as the case may be, will act in the same manner with relation to the pockets P and Q as do the chambers or pockets J and K—that is to say, the channel will form a chamber into which live steam from the pockets P will pass and afterward enter into pockets Q and act thereon in the manner set forth. Under this arrangement, however, the engine would be subject to side thrust, and it is not desirable to run the engine in this manner ordinarily.

Having thus described my invention, what I claim is—

1. In a rotary engine, the combination of a shell or casing provided with a steam-inlet; a rotary member mounted within said shell and provided with two series of pockets upon opposite sides of its center; and a preliminary exhaust-channel as K formed in the casing and extending approximately the length thereof designed to receive steam from one series of pockets and transfer it to the other.

2. In a rotary engine, the combination of a shell or casing provided with steam-inlets; pockets located over said inlets; preliminary exhaust channels or pockets extending the length of the casing at a point intermediate the steam-inlets; and a rotary member mounted within said casing and provided with two series of pockets arranged upon opposite sides of its center, said pockets alternating with each other in their disposition around said rotary member.

3. In a rotary engine, the combination of a shell or casing provided with steam-inlets opening into pockets formed therein; pockets J and K located in the side of the casing; a rotary member mounted within said casing and provided with two series of pockets arranged upon opposite sides of its center, and alternating with each other in their disposition therearound; and exhaust-channels D and E.

4. In a rotary engine, the combination of a shell or casing provided with steam-inlets and pockets into which they enter, long pockets J and K, short pockets L and M, and exhaust-ports; and a rotary member mounted within said shell or casing and provided with two series of pockets P and Q substantially as and for the purpose described.

In witness whereof I hereunto set my hand in the presence of two witnesses.

HANNIBAL HAMLIN AMES.

Witnesses:
P. P. PENDERGAST,
FRANCIS H. HAWLIK.