

(No Model.)

2 Sheets—Sheet 1.

G. W. MORTHLAND.
ROTARY ENGINE.

No. 518,465.

Patented Apr. 17, 1894.

Fig. 2

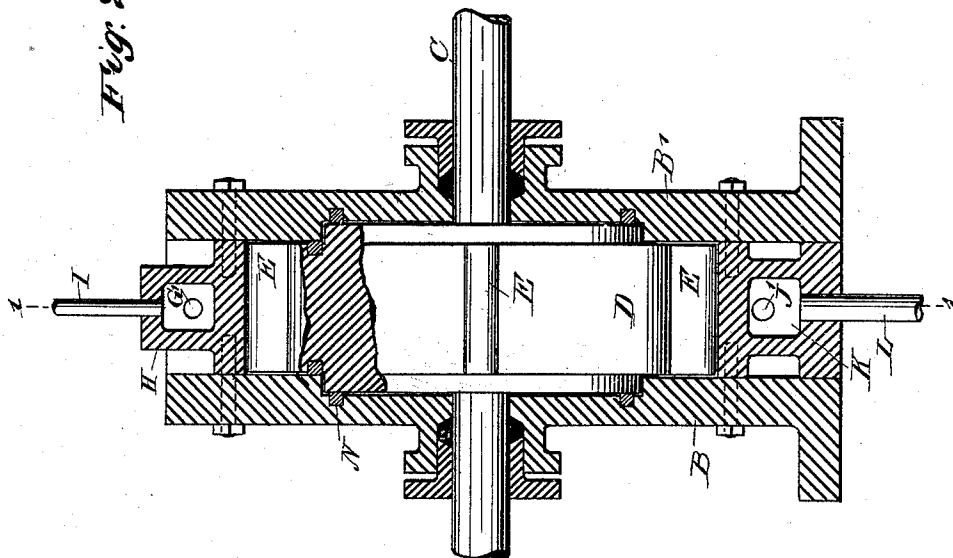
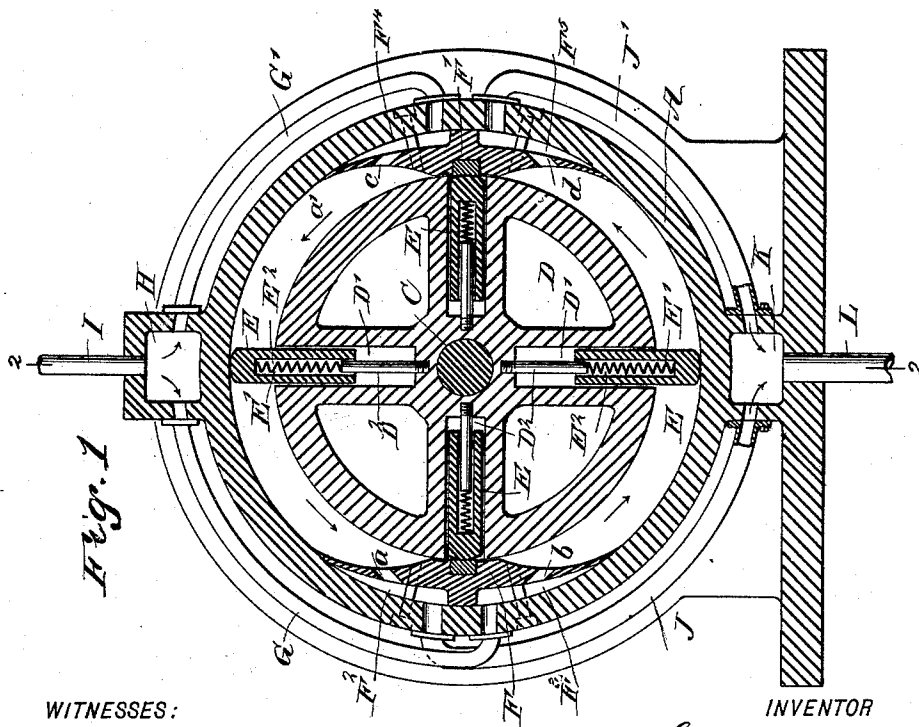


Fig. 1



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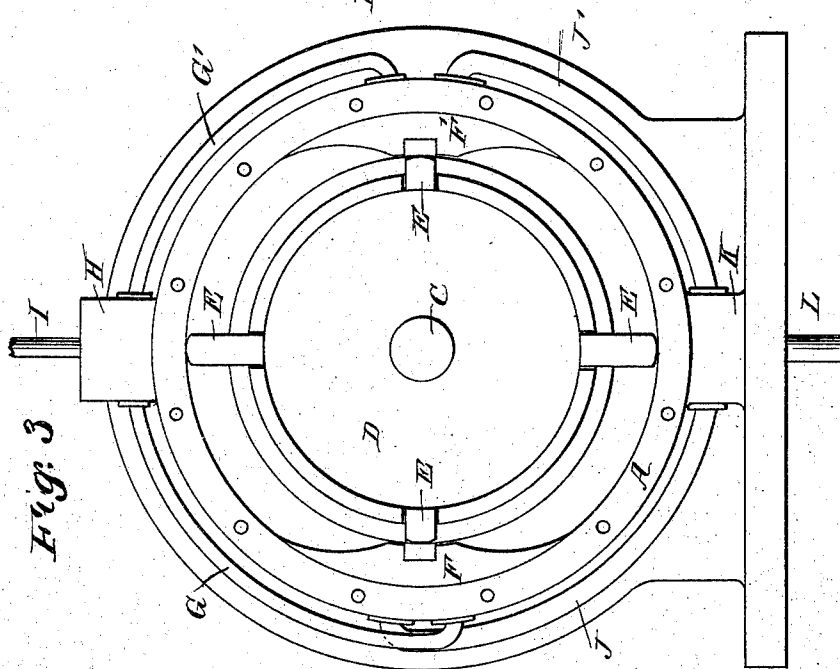
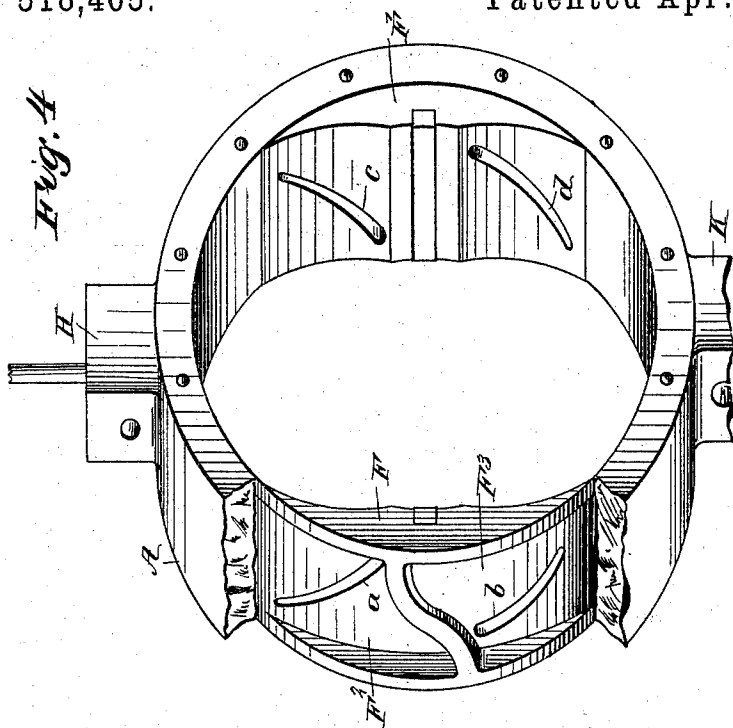
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WITNESSES:

J. a. Bengstrom
to Bodgerick

INVENTOR

G. W. Northland

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UNITED STATES PATENT OFFICE.

GEORGE W. MORTHLAND, OF LEAD, SOUTH DAKOTA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 518,465, dated April 17, 1894.

Application filed August 1, 1893. Serial No. 432,081. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MORTHLAND, of Lead, in the county of Lawrence and State of South Dakota, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

My invention is an improvement in that class of rotary engines whose cylinders are provided interiorly with abutments having ports for live and exhaust steam, and a wheel or rotating part having sliding, spring-pressed pistons.

The invention consists in the construction and arrangement of parts hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 of Fig. 2. Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1. Fig. 3 is a face view of the improvement with one of the heads removed; and Fig. 4 is a perspective view of the cylinder and its abutments, with parts broken out.

The improved rotary engine is provided with a cylinder A having the heads B, B', in which is journaled the transversely extending main driving shaft C, connected in the usual manner with the machinery to be driven. On the shaft C, within the cylinder A, is secured a wheel D somewhat less in diameter than the internal diameter of the cylinder A, the said wheel being provided with pistons E mounted to slide radially in recesses D' formed in the said wheel D. Each of the pistons E is cushioned, and for this purpose is provided with a recess E², in which is arranged a spring E' pressing with one end on the said piston, and with its other end on a pin D² secured to the wheel D and extending within the recess D'. Each of the pins D² forms a guide for its corresponding piston E.

On opposite sides of the cylinder A, and on the inside thereof, are secured the abutments F and F', having their middle portions in frictional contact with the peripheral surface of the wheel D, the sides of each abutment being curved to permit the pistons E to travel

up so as to move within their corresponding recesses D', and to pass out of the same during the time the pistons travel over the opposite side of the corresponding abutments.

The abutment F is formed with chambers F² and F³ and similar chambers F⁴ and F⁵ are arranged in the abutments F', as is plainly shown in Figs. 1 and 4. The chamber F² in the abutment F is connected by a diagonal or angular port *a* with the interior of the cylinder A, and a similar port *b* leads from the chamber F³ to the interior of the cylinder. The chambers F⁴ and F⁵ are likewise connected by angular ports *c* and *d* with the interior of the cylinder. Into the chambers F³ and F⁴ lead the steam inlet pipes G and G' respectively, connected at their upper ends with the steam chest H, from which leads a steam inlet pipe I, connected with the boiler or other steam supply. The chambers F² and F⁵ are connected by exhaust pipes J and J' with an exhaust chest K, from which leads a pipe L to the outside, to carry off the exhaust steam.

The sides of the wheel D are preferably packed by suitable packing rings N, so as to render the wheel D steam tight within the cylinder A.

The operation is as follows: When the several parts are in the position illustrated in Fig. 1, then steam passes simultaneously from the steam chest H, through the pipes G and G', into the chambers F³ and F⁴ and from the latter through the ports *b* and *c* into the interior of the cylinder A, to exert a pressure on the two oppositely arranged pistons E now extending to the internal surface of the cylinder A. The pressure exerted by the motive agent on the said pistons causes a turning of the wheel D in the direction of the arrow *a'*, the exhaust steam in front of the said piston passing through the ports *a* and *d* into the chambers F² and F⁵ respectively, from which chambers the steam passes through the pipes J and J' to the exhaust steam chest K, and by the pipe L to the outside. Thus, it will be seen that by this arrangement the motive agent acts always on two oppositely arranged pistons at the same time, whereby all dead center positions of the wheel D are avoided, and a full pressure movement is given to the

wheel and the main driving shaft C. By ar-
ranging the ports *a*, *b*, *c* and *d* angularly in
the abutments F and F', unequal wear on the
outer edges of the pistons E is prevented, and
5 at the same time the steam is permitted to
exhaust as soon as the piston commences to
slide inward on reaching and traveling up the
corresponding side of the respective abut-
ment. At the same time the motive agent is
10 supplied to the cylinder through the corre-
sponding inlet port *b* or *c* soon after the cor-
responding piston passes the middle of the
respective abutment.

Having thus fully described my invention,
15 I claim as new and desire to secure by Letters
Patent—

A rotary engine comprising a cylinder hav-
ing a steam inlet chest and an exhaust chest,
abutments secured to the inside of the cylin-

der on opposite sides thereof, each abutment 20
being provided with a steam receiving cham-
ber and a steam exhaust chamber, having the
angular ports arranged as specified, and which
connect it with the interior of the cylinder, a
wheel mounted to rotate in the said cylinder, 25
spring-pressed pistons fitted to slide in the
said wheel and adapted to engage the inner
surface of the said cylinder and the said abut-
ments, pipes connecting the steam receiving
chambers with the said steam inlet chest, and 30
other pipes connecting the steam exhaust
chambers with the said exhaust chest, sub-
stantially as shown and described.

GEORGE W. MORTHLAND.

Witnesses:

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L. B. PATTERSON.