(No Model.) 2 Sheets—Sheet 1.

G. W. MORTHLAND.

ROTARY ENGINE.

No. 518,465. Patented Apr. 17, 1894.

Fig. 2.

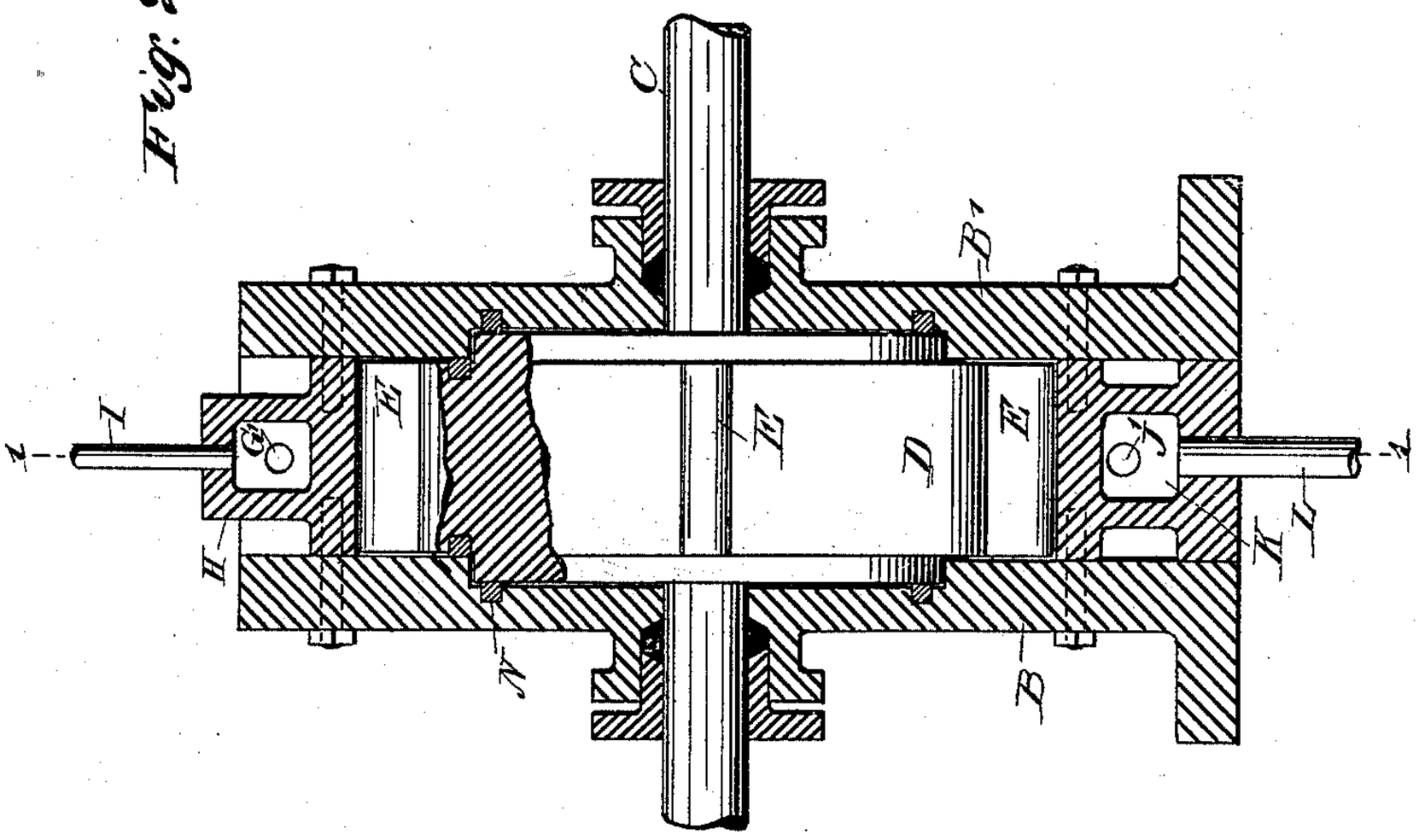

Fig. 1.

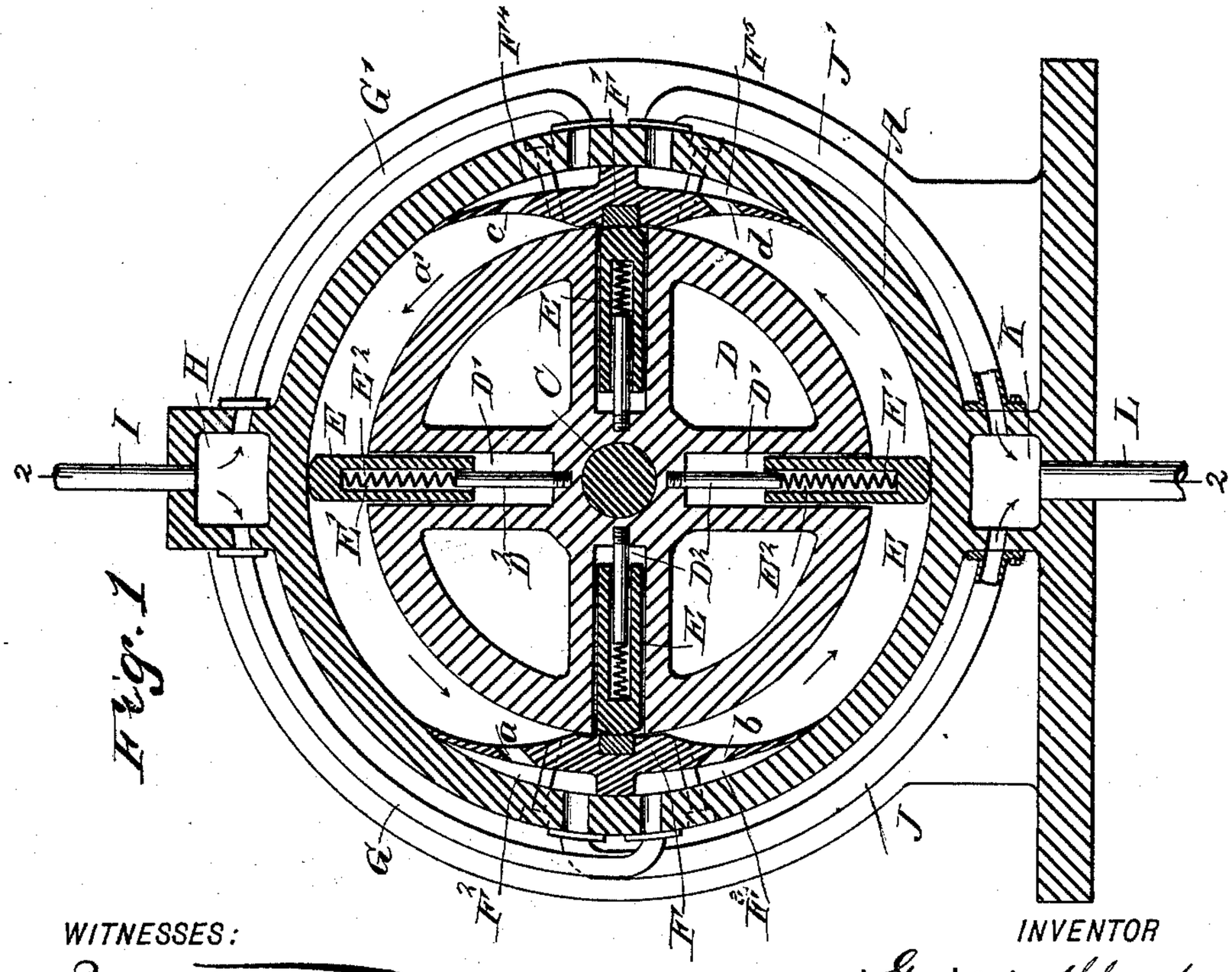

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Fig. 4

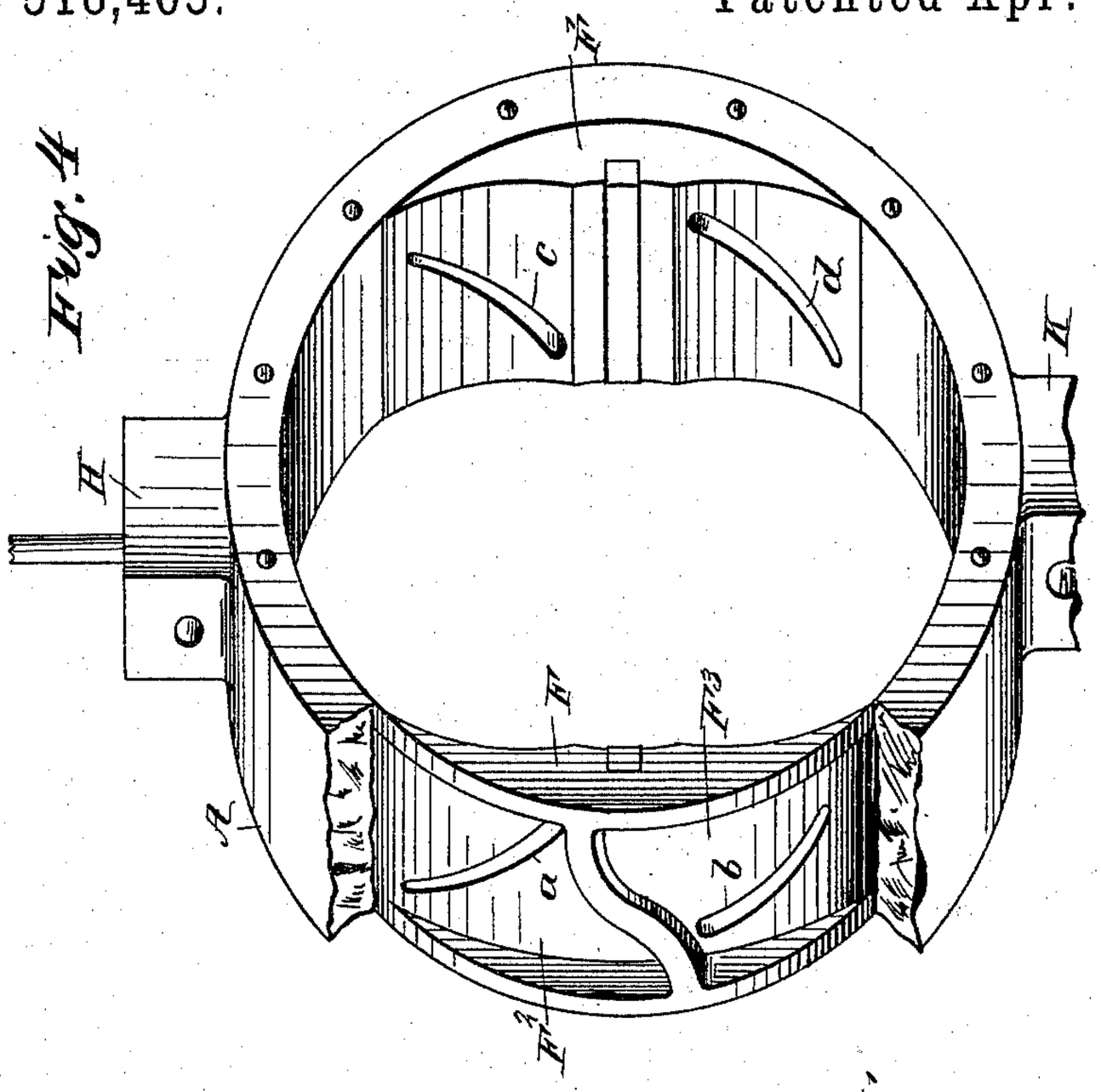

Fig. 3

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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. 482,081. (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 E^2, in which is arranged a spring E′ pressing with one end on the said piston, and with its other end on a pin D^2 secured to the wheel D and extending within the recess D′. Each of the pins D^2 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 F^2 and F^3 and similar chambers F^4 and F^5 are arranged in the abutments F′, as is plainly shown in Figs. 1 and 4. The chamber F^2 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 F^3 to the interior of the cylinder. The chambers F^4 and F^5 are likewise connected by angular ports *c* and *d* with the interior of the cylinder. Into the chambers F^3 and F^4 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 F^2 and F^5 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 F^3 and F^4 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 F^2 and F^5 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 arranging 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 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 abutment. At the same time the motive agent is supplied to the cylinder through the corresponding inlet port *b* or *c* soon after the corresponding piston passes the middle of the respective abutment.

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

A rotary engine comprising a cylinder having a steam inlet chest and an exhaust chest, abutments secured to the inside of the cylinder on opposite sides thereof, each abutment being provided with a steam receiving chamber 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, spring-pressed pistons fitted to slide in the said wheel and adapted to engage the inner surface of the said cylinder and the said abutments, pipes connecting the steam receiving chambers with the said steam inlet chest, and other pipes connecting the steam exhaust chambers with the said exhaust chest, substantially as shown and described.

GEORGE W. MORTHLAND.

Witnesses:
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L. B. PATTERSON.