

(No Model.)

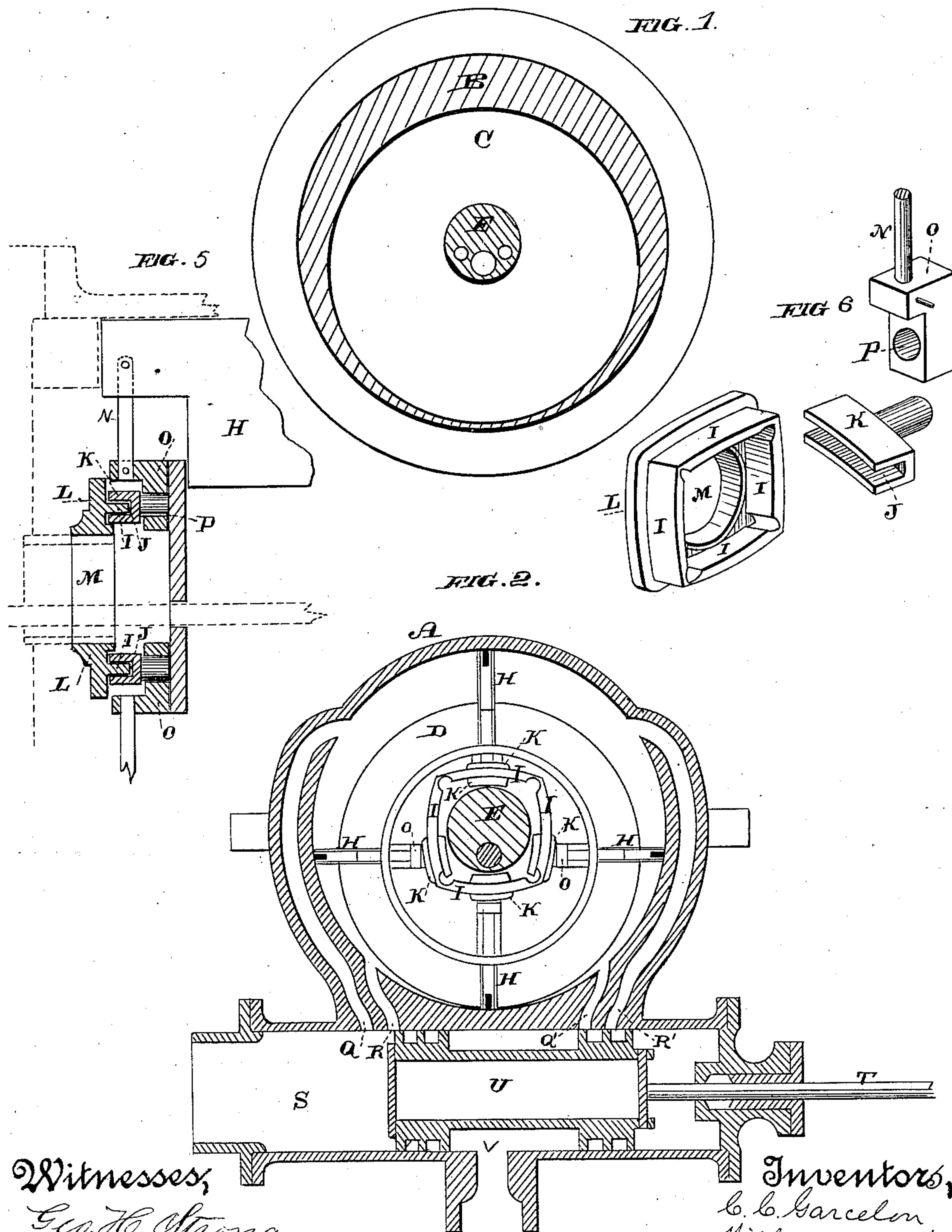
2 Sheets—Sheet 1.

C. C. GARCELON & W. A. WOODS.

ROTARY ENGINE.

No. 280,027.

Patented June 26, 1883.



Witnesses,
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(No Model.)

2 Sheets—Sheet 2.

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FIG. 3.

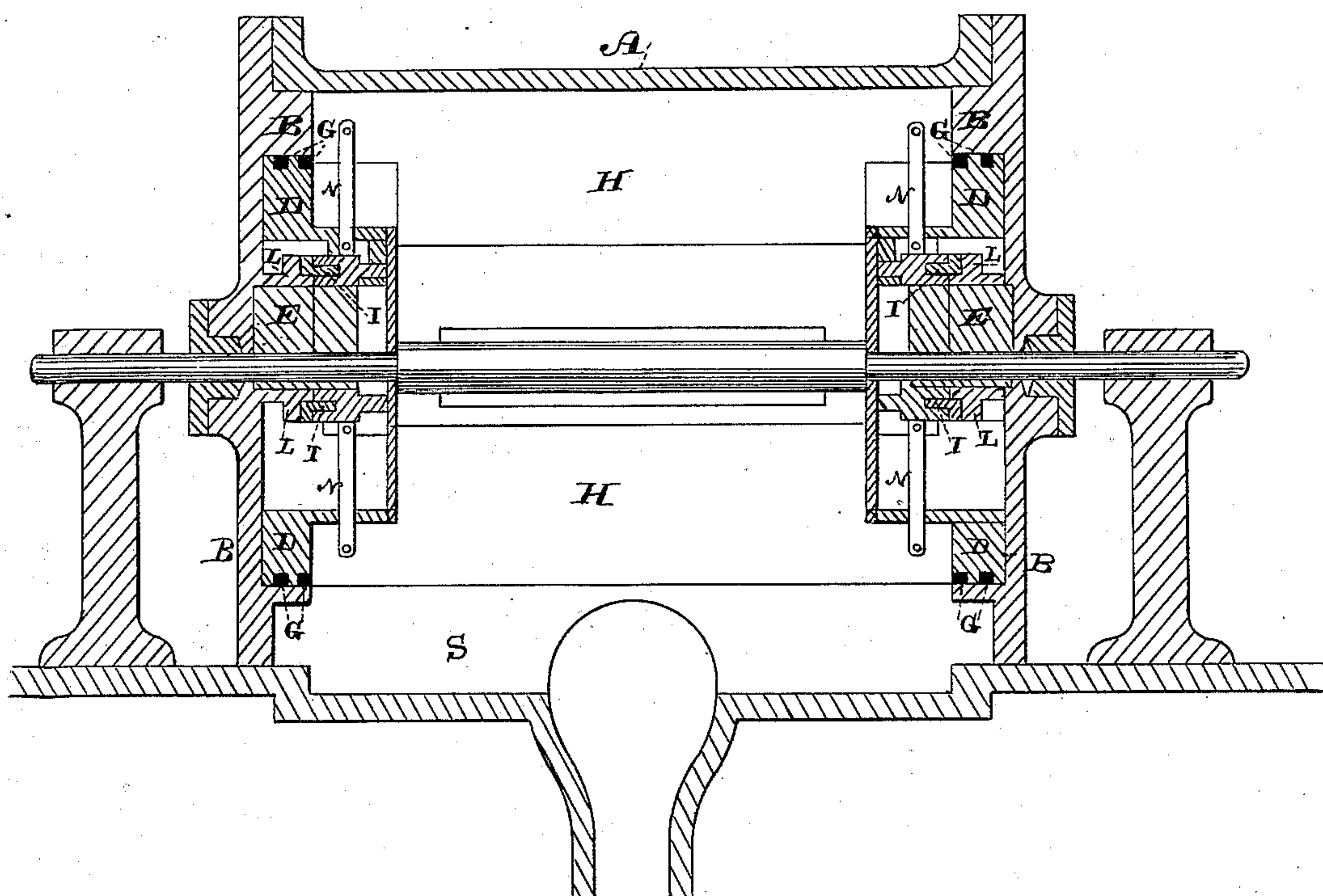
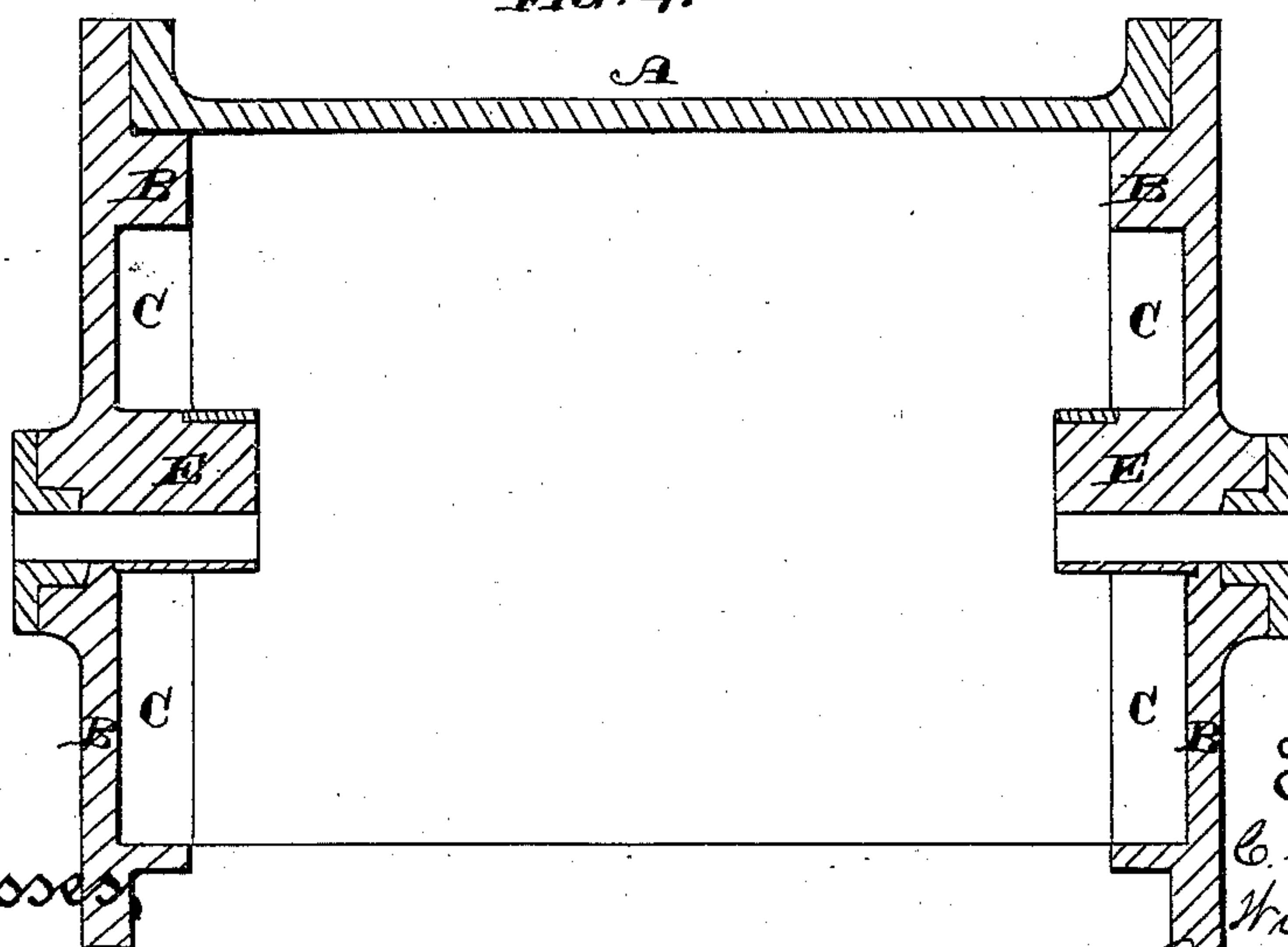


FIG. 4.



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UNITED STATES PATENT OFFICE.

CHARLES C. GARCELON AND WILLIAM A. WOODS, OF SANTA CRUZ, CAL.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 280,027, dated June 26, 1883.

Application filed April 21, 1883. (No model.)

To all whom it may concern:

Be it known that we, CHARLES C. GARCELON and WILLIAM A. WOODS, of Santa Cruz, county of Santa Cruz, State of California, have
5 invented an Improved Rotary Engine; and we hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to certain improvements in rotary engines; and it consists in certain details of construction and combinations
10 of devices, as hereinafter fully described and claimed.

Steam is admitted through one or two ports, so as to be used expansively, and by means of
15 a hollow piston-valve one or both ports may be opened or closed, or the engine may be reversed.

Referring to the accompanying drawings for a more complete explanation of our invention,
20 Figure 1 is an end view, showing the interior of the case. Fig. 2 is a transverse section, showing the case with the pistons and operating mechanism in place, also ports and valve. Fig. 3 is a longitudinal section through the
25 case-rotating cylinder which carries the pistons and the shaft. Fig. 4 is a section of the exterior case, showing the countersunk heads and eccentrics. Figs. 5 and 6 are details of construction.

30 A is the exterior case, which is made cylindrical and of any desired length, having heads B, which are countersunk, as shown at C, to receive the ends of the piston-carrying cylinder D. These countersunk depressions are eccentric with the interior of the case, and have
35 fixed eccentrics E, projecting inwardly from the head, as shown, the shaft F passing through their lower part and the cylinder D, which extends into and fits the depressions. Packing-
40 rings G are fitted into grooves in the cylinder ends, so as to make a steam-tight joint at each end. The pistons are in the form of plates H, having their edges grooved to receive packing, as shown. The cylinder D, fitting into the de-
45 pressions C in the heads, turns eccentrically to the interior of the case, touching it upon one side, and the pistons H are drawn in, so as to become flush with the face of the cylinder when passing this point, and they are

forced out gradually, so as to touch the inte- 50
rior of the case and receive the steam-pressure after leaving this point. This movement of the pistons is performed by the stationary interior eccentrics, E, in conjunction with a
55 square flange, I, which enters grooves J in the blocks K. The flange projects from one side of a disk, L, which has a hole, M, made in it just large enough to fit over the eccentric E, and it is thus caused to move eccentrically to
60 the cylinder as it is carried by it around the stationary eccentric.

The pistons H have stems N at each end, passing through openings near the ends of the cylinder D. The inner ends of these stems
65 have heads O, with holes P made transversely through them to receive the cylindrical stems of the blocks K. This connection allows the blocks K to adjust themselves to the movements of the flange I and the eccentric E, which gives the flange motion. 70

The operation will be as follows: When the cylinder D is in motion it carries the pistons H, their stems, and the heads O. The slotted
75 blocks K are loosely connected with these heads by their stems, and the slots J fit over the edges of the flanges I, so as to slide upon them as they are moved by the eccentrics. The disks L, from which the flanges project, fit around the eccentrics, and they are carried
80 around with the cylinder D by their connection with it, so that the stationary eccentrics through them give motion to the pistons and force them out so as to fit closely against the interior of the case, without any such frictional
85 pressure as would be necessary if the pistons were moved out and in by the action of the case or by exterior cams. By the flanges I sliding within the grooved blocks K the move-
90 ment of the eccentric is made to impart only a radial motion to the piston-stems, and this enables us to keep the packing at the edges of the pistons in good order and to maintain the same angle of contact between them and the interior of the case. Steam is admitted to and
95 exhausted from the case by ports Q R and Q' R', which are cored out around the outside, opening into it at points as far apart as the distance between the pistons, as shown. The

opposite ends of these ports communicate with a cylindrical chamber, S, beneath the case, one end of which is open for the escape of exhaust-steam, while the other end has a head and stuffing-box, through which the stem T passes to operate the valve U. This valve is hollow and cylindrical, having a head at each end, which fits the cylinder S, while the central portion is made smaller, so that steam which is admitted through the passage V may surround this part of the valve, and when the valve is in proper position may enter the ports Q R or Q' R' to drive the engine forward or back, as may be desired. The distance between the heads of the valve is such that when the valve is set centrally steam is cut off from the ports at both sides of the engine; but when moved to one side steam may either be admitted to the port Q or to both Q and R, while it will exhaust from Q' R'. If moved to the opposite end, the admission of steam will be to Q' or Q' R', and the exhaust will take place through the ports Q R, and thence out through the center of the hollow valve and the open end of the valve-chamber S.

The operation of our engine is as follows: When it is to be started the valve U is moved by its stem and any suitably-connected lever until both ports Q and R are open, thus allowing steam to flow through both into the case and to press upon two of the pistons H at the same time. When the engine has been started, if it is desired to use steam expansively, it is done by moving the valve U until the port R has been closed, and steam is only admitted through the port Q. But a small portion of the piston has been projected from the cylinder D at this point, and the steam follows it as it is gradually forced out, until the next piston reaches the port and intercepts any further supply to the first piston. The remainder of its stroke to the point where it passes the first exhaust-opening is completed under pressure of the expanding steam.

It will be manifest that steam, air, or any suitable vapor or gas, or in some cases a liquid, may be used as a motor, and it will also be

seen that two or more engines may be applied to the same shaft, if desired.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The cylinder D, turning in the depressions C, formed in the heads B, eccentric to the interior of the case, and having the radially-moving pistons H, with stems N, with heads O, as shown, in combination with the disk L, with the flanges I, the grooved blocks K, and the stationary eccentric E, substantially as herein described.

2. The stationary eccentric E and the cylinder D, with its pistons H, fitted to the case A, and heads B, as shown, in combination with the disk L, inclosing and moving about the eccentric, and having the flanges I projecting from one side as shown, the blocks K, loosely connected with the heads O of the stems N of the pistons, said blocks having slots J to fit the flanges and adjust themselves to the movement of the eccentric, substantially as herein described.

3. The case A, having the cylinders D, mounted upon a shaft not in the axis of the case, and the radially-moving pistons H, as shown, in combination with the ports Q R Q' R', the valve-chamber S, and the valve U, substantially as and for the purpose herein described.

4. The case A, with the ports Q R and Q' R', leading from opposite sides into the cylindrical valve-chamber S, as shown, in combination with the valve U, having the ends made of larger diameter than the center to fit the cylinder, said valve having a passage made longitudinally through it, substantially as herein described.

In witness whereof we hereunto set our hands.

CHARLES C. GARCELON.
WILLIAM A. WOODS.

Witnesses:

S. H. NOURSE,
G. W. EMERSON.