

(No Model.)

G. W. DUDLEY.

ROTARY ENGINE.

No. 259,111.

Patented June 6, 1882.

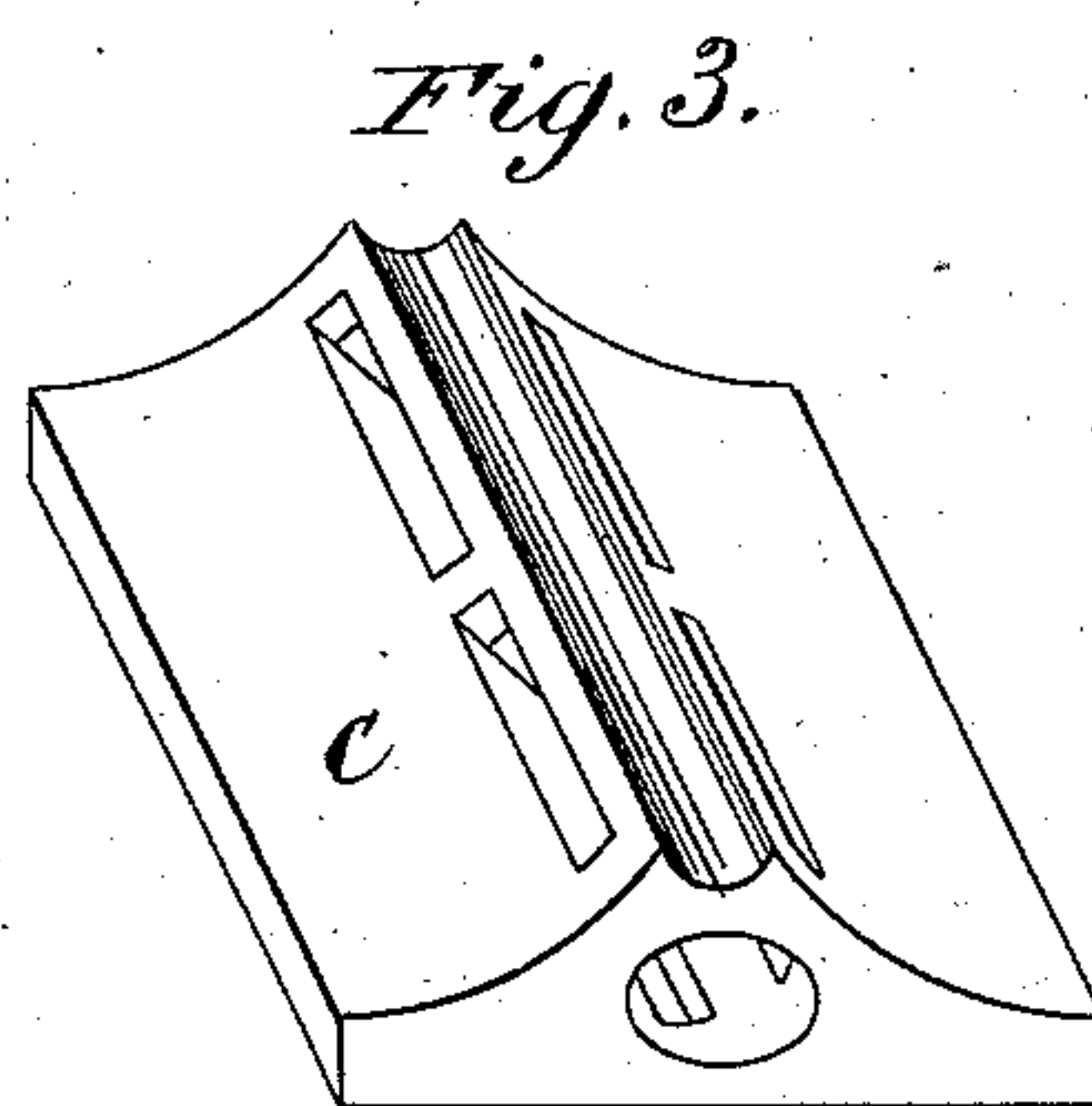
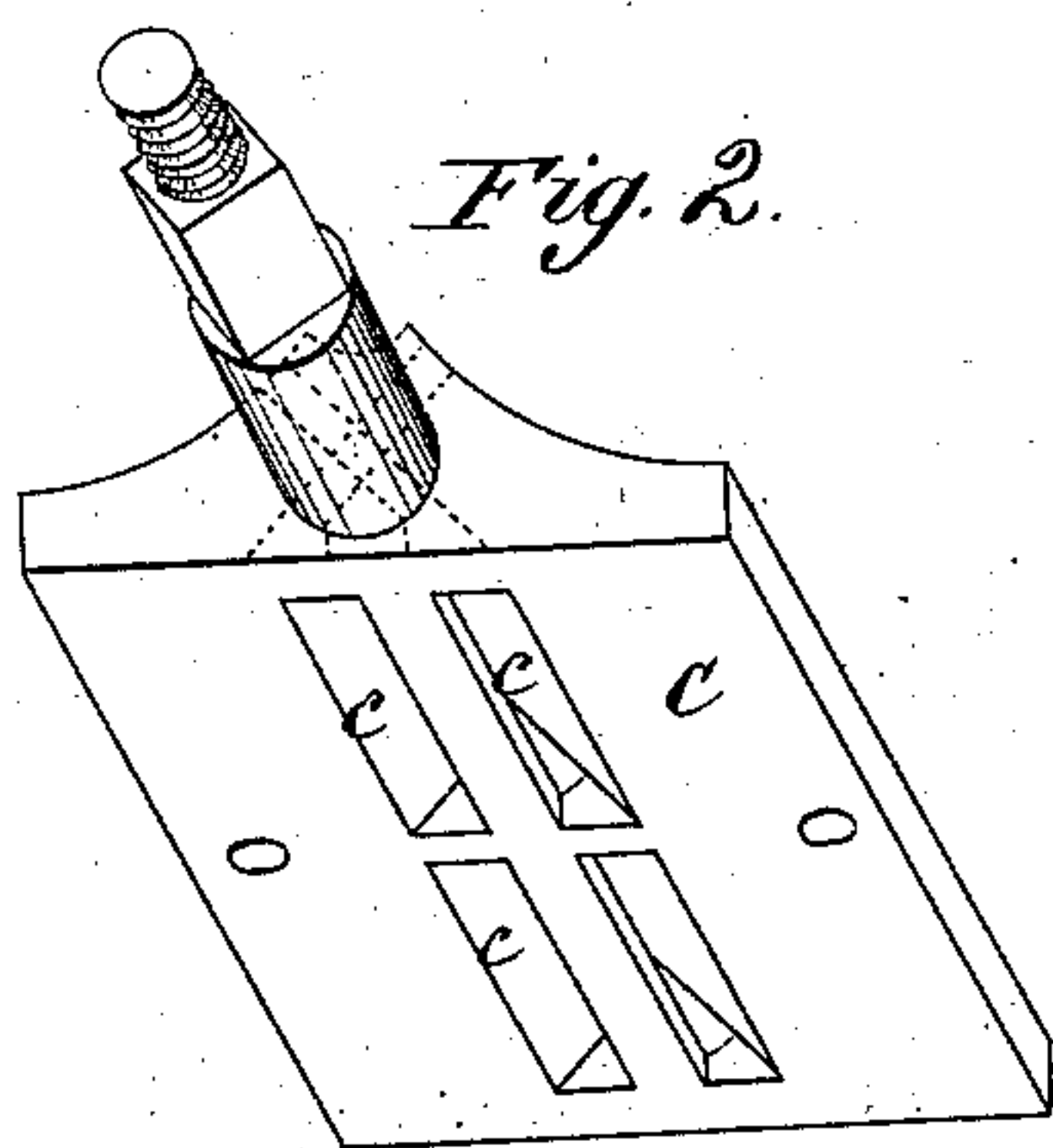
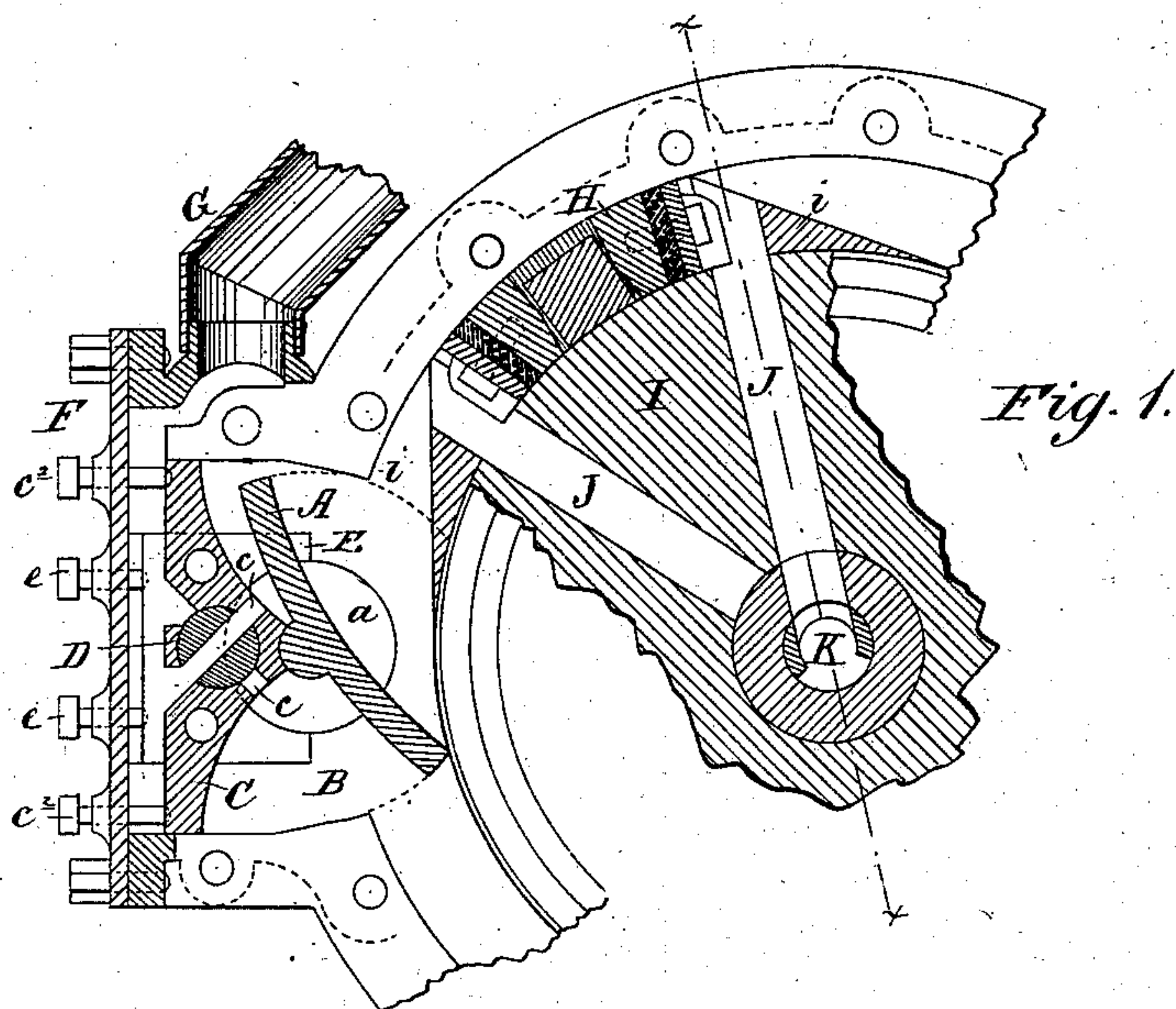
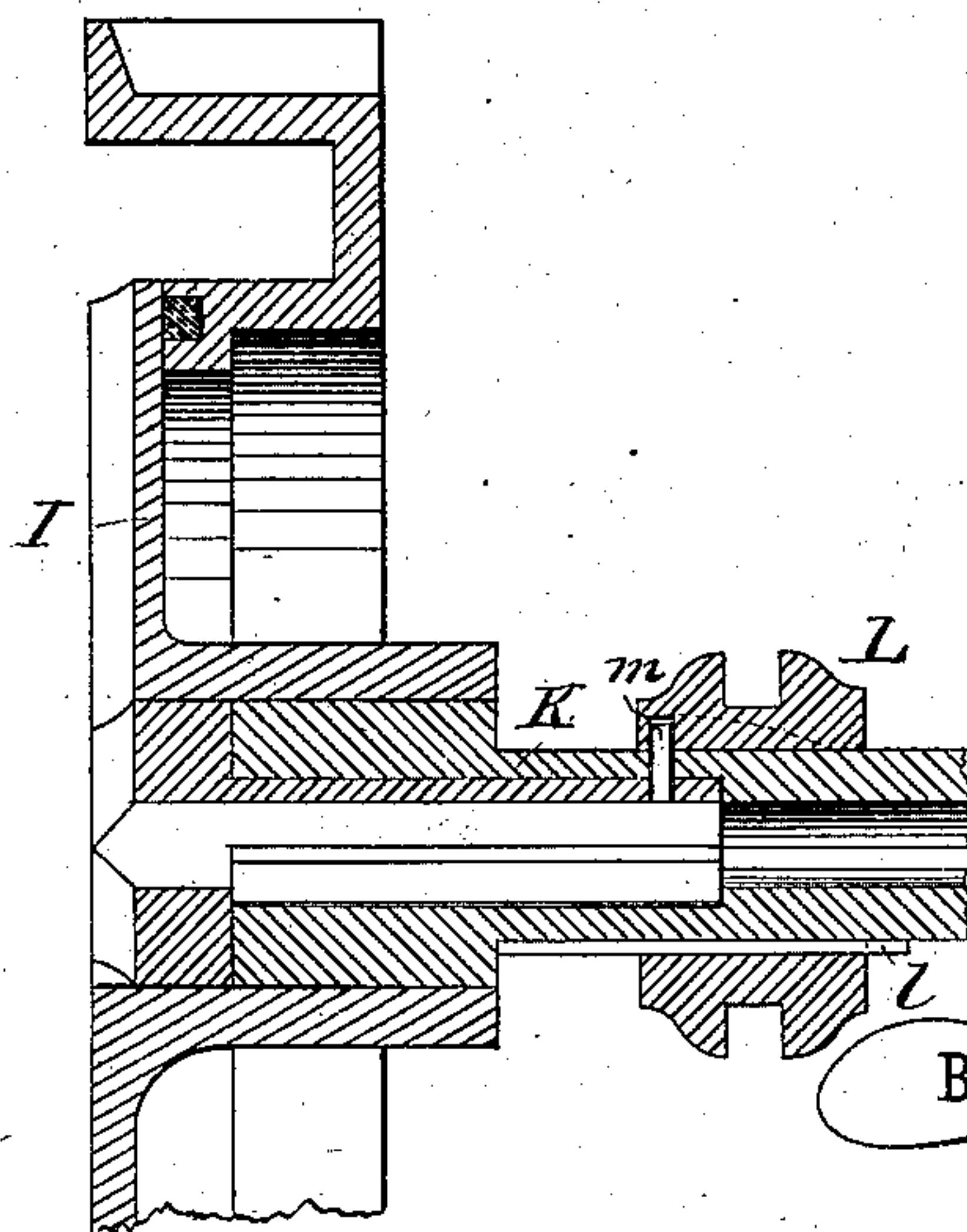


Fig. 4.



WITNESSES:

W. W. Hollingsworth
A. G. Lyne.

INVENTOR:

G. W. Dudley

BY

Wm. & L.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE W. DUDLEY, OF WAYNESBOROUGH, VIRGINIA, ASSIGNOR TO THE ELASTIC WHEEL AND MANUFACTURING COMPANY, OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 259,111, dated June 6, 1882.

Application filed September 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. DUDLEY, of Waynesborough, in the county of Augusta and State of Virginia, have invented a new and useful Improvement in Rotary Engines, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

10 The present invention relates to an improvement in rotary engines described in Letters Patent No. 236,007, which were granted to me under date of December 28, 1880. In the said patent I have shown a rotary engine consist-
15 ing in a casing provided with an annular chamber and a segmental piston secured to the periphery of a disk, which rotates with a central hollow shaft, and which is provided with radial ports communicating with the annular
20 chamber upon opposite sides of the piston, in combination with segmental valves which are hinged to oscillating valve-seats in suitable chambers at the side of the casing, and means for reversing the positions of the valve-seats,
25 whereby the engine may be caused to rotate in either direction.

In my present invention, instead of having the seat of the exhaust-valve arranged to oscillate for the purpose of reversing the engine,
30 I have made the seat stationary and provided it with a plug-valve, by means of which the exhaust may escape at either end of the exhaust-valve. I have also provided an improved means of shifting the valve in reversing the engine, and have made certain improvements relating to the segmental piston, as will
35 be hereinafter described.

In the accompanying drawings, Figure 1 is a vertical section of one of the exhaust-chambers and a portion of the steam-chamber, showing the arrangement of the exhaust-valves and the construction of the segmental piston. Fig. 2 is a perspective of one of the valve-seats with the plug-valve in position. Fig. 3 is a
40 similar view with the plug-valve removed; and Fig. 4 is a sectional view on line *x x*, Fig. 1, showing a portion of the valve K and means for operating it.

The segmental exhaust-valve A is provided
50 with journals *a* at each side, and is supported in bearings formed in the walls of exhaust-

chamber B. The valve-seat C, which forms a knuckle-joint with the exhaust-valve, is provided with ports *c*, opening behind the exhaust-valve, and a plug-valve, D, by means of which
55 either port may be opened.

For taking up the wear in the journals of the exhaust-valve, I provide plates E, having semi-cylindrical recesses, which are inserted in recesses formed in the side walls of the exhaust-
60 chamber, so as to fit against the said journals, and which are adapted to be adjusted according to the requirement of the case by means of set-screws *e*, which are inserted through the
65 outer plate, F, by which the opening leading to the exhaust-chamber is closed, so that their inner ends shall take against the said plates or enter recesses formed therein. In like manner the valve-seat C is provided with set-screws *e*², which are adapted to take up wear between
70 the exhaust-valve and the said seat. With this construction the ports *c* communicate with the exhaust-pipe G by means of the passage between the valve-seat C and the outer plate, F, which is secured to the casing so as
75 to form one of the walls of the exhaust-chamber.

The segmental piston H is secured to the disk I, between two tangential projections formed on the periphery of said disk. These
80 projections *i*, which are solid, constitute a part of the piston, and the ports J are made to pass through the said projections at their highest point, so that a close and instantaneous connection shall be formed between the port and
85 the abutting end of the exhaust-valve when the piston passes the said valve.

For shifting the valve K, I provide a clutch-collar, L, which is adapted to slide upon a feather, *l*, on the outer surface of the hollow
90 central shaft, M, and which is provided with an internal groove, in which fits a pin, *m*, passing through a slot in the hollow shaft, and rigidly secured to the said valve. With this construction, when the collar is made to slide
95 upon the feather *l* the pin *m* will follow the spiral groove and cause the valve to be shifted from one port J to the other, and thus allow the steam to pass to the opposite side of the piston.

It is designed that suitable connections shall
100 be formed between the valve K and the plug-

valve D, so that the same movement may suffice for adjusting the valves in reversing the engine.

The operation of the engine is as follows:
 5 When steam is admitted into the piston-chamber through one of the radial ports J one of the two exhaust-valves A arranged on opposite sides of the piston-chamber, serves as an abutment for the steam, and the piston H is
 10 forced toward the opposite exhaust-valve, passing under its abutting end, and thus closing the valve. When the piston has thus passed under the abutting end of the exhaust-valve, and proceeds to pass beyond it, the said abutting
 15 end is caused to slide down the tangential projection *i* at the rear of the piston by the pressure of the steam against the opposite end thereof, which tends to force the exhaust-valve open. As soon, however, as the port J
 20 at the rear of the piston has passed the abutting end of the exhaust-valve A the steam is admitted behind the said abutting end, and thus, as the piston passes on, said abutting end is held in close contact with the said projec-
 25 tion *i* until it reaches the bottom of the piston-chamber and the exhaust-valve is completely opened, allowing the exhaust-steam to escape. In this manner each exhaust-valve in turn serves as an abutment for the steam, and at
 30 the same time keeps the exhaust-valve open, the said valve being closed only at the instant the piston is passing under it. It will be seen that in this manner the abutting ends of the exhaust-valves are made to form a close con-
 35 nection with the tangential projections *i*, so that the live steam is instantly cut off from the

exhaust as the port J is successively carried beyond the said abutting ends. When the engine is reversed the operation is precisely the same, but in the opposite direction. 40

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a rotary engine, the combination, with the double exhaust-valve A, of the disk I, having solid tangential projections *i* and ports J 45 issuing through the said projections at their highest point, and the segmental piston H, secured between said projections, substantially as shown and described, whereby an abutment shall be formed simultaneously with the opening of the exhaust-valve, as set forth. 50

2. In a rotary engine, the combination, with the segmental exhaust-valve A, supported in the walls of its chamber, and the stationary 55 valve-seat C, forming a knuckle-joint with the valve A, of the outer plate, F, forming a wall of the said chamber, and provided with set-screws *e c*², and the recessed plates E, substantially as shown and described, and for the 60 purpose set forth.

3. In a rotary engine, the combination, with the valve K, having a pin, *m*, which projects through a slot in the hollow shaft M, of the clutch-collar L, having an internal spiral groove 65 for receiving the pin, and adapted to slide upon a feather, *l*, on the outer surface of the said shaft, substantially as shown and described.

GEORGE W. DUDLEY.

Witnesses:

A. G. LYNE,
 SOLON C. KEMON.