

*G. Ambrose,
Rotary Steam Engine.*

N^o 20,613.

Patented June 22, 1858.

Fig: 2.

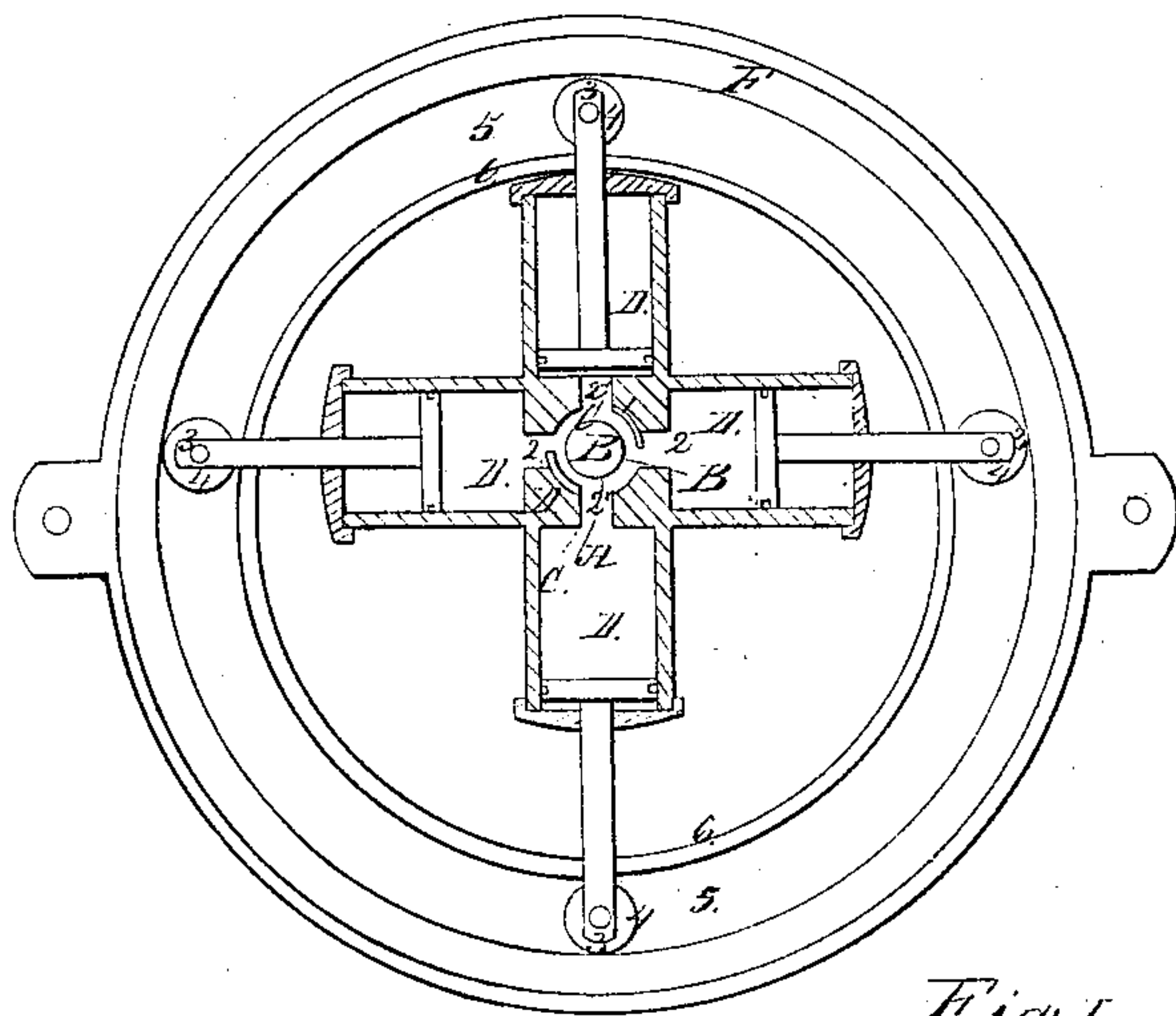


Fig: 1.

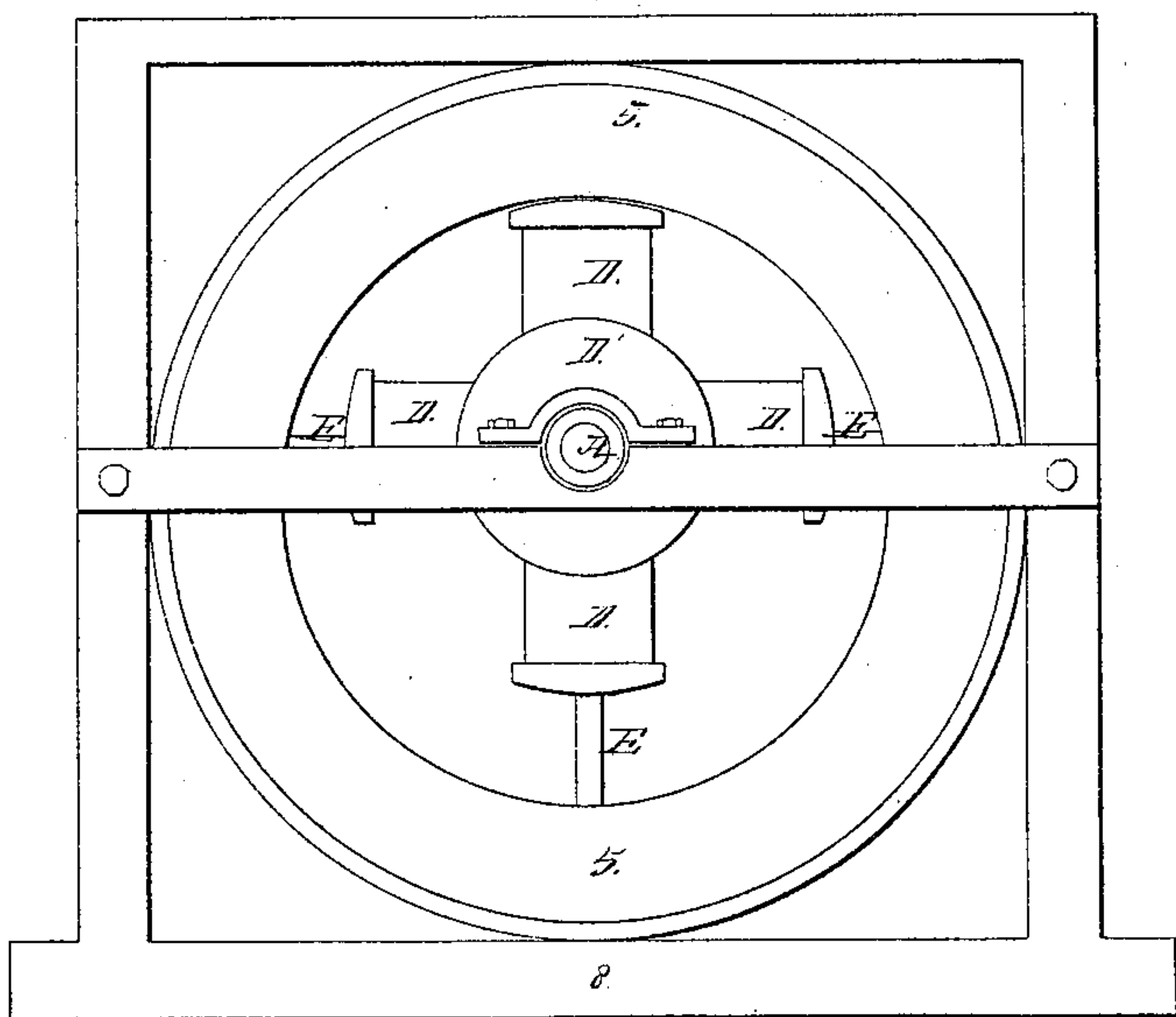
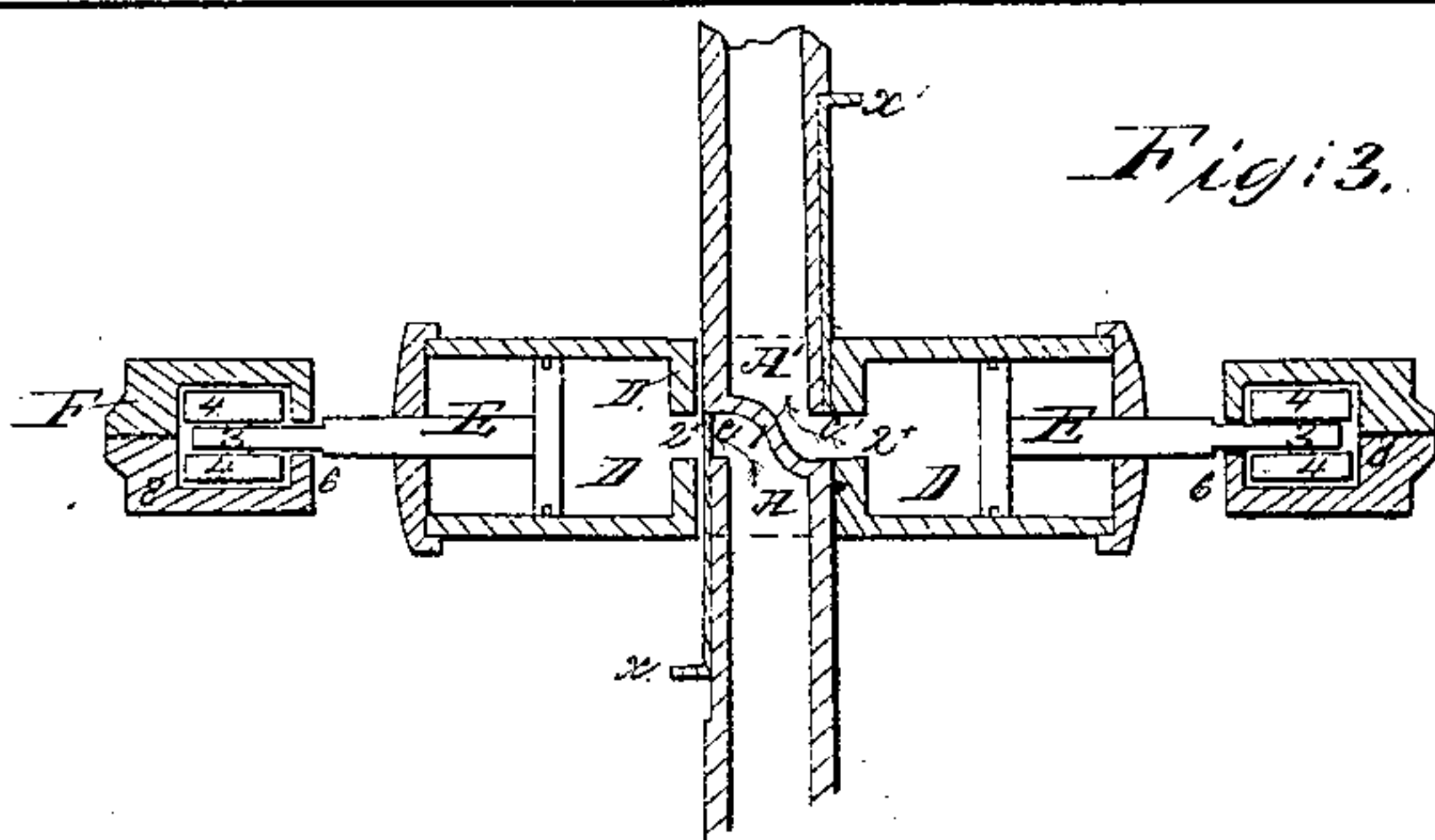


Fig: 3.



Witnesses:

*James B. Davidson
John A. Foster*

Inventor:

Geo. Ambrose

UNITED STATES PATENT OFFICE.

GEO. AMBROSE, OF NEW YORK, N. Y.

RECIPROCATING ROTARY ENGINE.

Specification of Letters Patent No. 20,613, dated June 22, 1858.

To all whom it may concern:

Be it known that I, GEORGE AMBROSE, of the city, county, and State of New York, have invented a new and useful Improvement in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, is a side elevation of an engine constructed with my improvement. Fig. 2, is a vertical, longitudinal section of the same. Fig. 3, is a horizontal section of the same.

Similar letters of reference in each of the several figures indicate corresponding parts.

My invention simply embraces the arrangement and combination in a rotary engine of the following peculiar features, to wit: 1st, a stationary axle furnished with two ports, one answering as the supply and the other as the exhaust to a series of cylinders; said ports being separated by a transverse S shaped partition so that the steam shall be received at one end of the axle and exhausted through the other; 2nd, a series of revolving cylinders with pistons whose rods have friction rollers on their outer ends; 3rd, an annular grooved eccentric rim which has an inner and outer bearing for said friction rollers of the piston rods, and 4th, two cut-off slides, one arranged at the supply and the other at the exhaust port of the hollow axle, and intermediate between the revolving hub of the steam cylinders and said stationary hollow axle, for the purpose of regulating the admission of steam to and the escape of the same from the cylinders, as may be desirable or necessary.

To enable others, skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, A', in the accompanying drawing represents the hollow axle; 1, the *cyma reversa* shaped transverse or diagonal partition which divides the hollow axle into two compartments, the compartment A, serving for supplying, and A', for exhausting the steam.

C, C', represent passages or ports provided at opposite points in the periphery of the axle. The passage C, communicates with the supply end of the axle, and C', with the exhaust end.

D, D, D, D, are four radial cylinders constructed upon a common hollow hub D',

which encircles snugly the hollow axle as shown. In the hollow hub D' four passages 2, 2, 2*, 2*, are provided, said passages leading into the cylinders and each pair of them successively communicating with the supply and exhaust ports or passages C, C', of the hollow axle as the hollow hub and the cylinders with it revolves around said axle. The successive communication of the two pair of cylinders with the hollow axle and the accomplishment of the supply and exhaust of said cylinder result from having only two ports for the four cylinders, and said ports arranged one opposite the other, and the communication of one with the other cut off by means of the diagonal *cyma reversa* shaped partition.

E, E, E, E, are four pistons fitted to the cylinders D, D, D, D.

F, is a stationary annular grooved rim fitted, eccentrically to the axle, in the frame A. In the groove 5, of this rim the ends 3, of the piston rods pass and connect with short axles which carry friction wheels 4, 4, as shown. Thus confining the ends of the piston rods insures the keeping in place of the same and a consequent regular and easy action of the engine. It will be observed that the groove in the rim provides an inner bearing 6, and an outer one 8, for the friction wheels and thus while a portion of the wheels are in contact with the inner bearing the other portion are in contact with the outer bearing. With this arrangement a lever power is obtained from the inclined plane or eccentricity of the rim when the engine is working with a vacuum.

7, 7', are two cut off slides arranged at opposite ends of the hollow hub, intermediate between the said hub and the hollow axle, as shown in Fig. 3. The slide 7, serves for cutting off or regulating as may be necessary the supply of steam to the cylinders, and 7', serves for regulating the exhaust from the cut off port according as the slide of the supply port is adjusted.

The advantages of my improved combination and arrangement in a rotary engine are compactness, simplicity, freedom from liability to derangement and the avoidance, to a considerable extent of the friction common to rotary engines.

What I claim as my invention and desire to secure by Letters Patent, is—

The arrangement and combination in a rotary engine, in the manner herein speci-

fied, of the following peculiar features, to wit, 1st, a stationary axle A, furnished with two ports C, C', one answering as the supply and the other as the exhaust to a series
5 of cylinders, said ports being separated by a transverse S shaped partition 1, so that the steam shall be received at one end of the axle and exhausted through the other; 2nd,
10 a series of revolving cylinders D, D, D, D, D', with pistons whose rods have friction rollers 4, 4, on their outer ends; 3rd, an annular grooved eccentric rim F, which has an inner and outer bearing for said friction rollers of the piston rods, and 4th, two cut-

off slides 7, 7', one arranged at the supply and the other at the exhaust port of the hollow axle, and intermediate between the revolving hub D', of the steam cylinders and said stationary hollow axle, for the purpose of regulating the admission of steam
20 to and the escape of the same from the cylinders, as may be desirable or necessary, all of the above parts being for united use, and the purposes set forth.

GEO. AMBROSE.

Witnesses:

JAMES BERRIAN, Jr.,
JOHN A. FOSTER.