

No. 708,742.

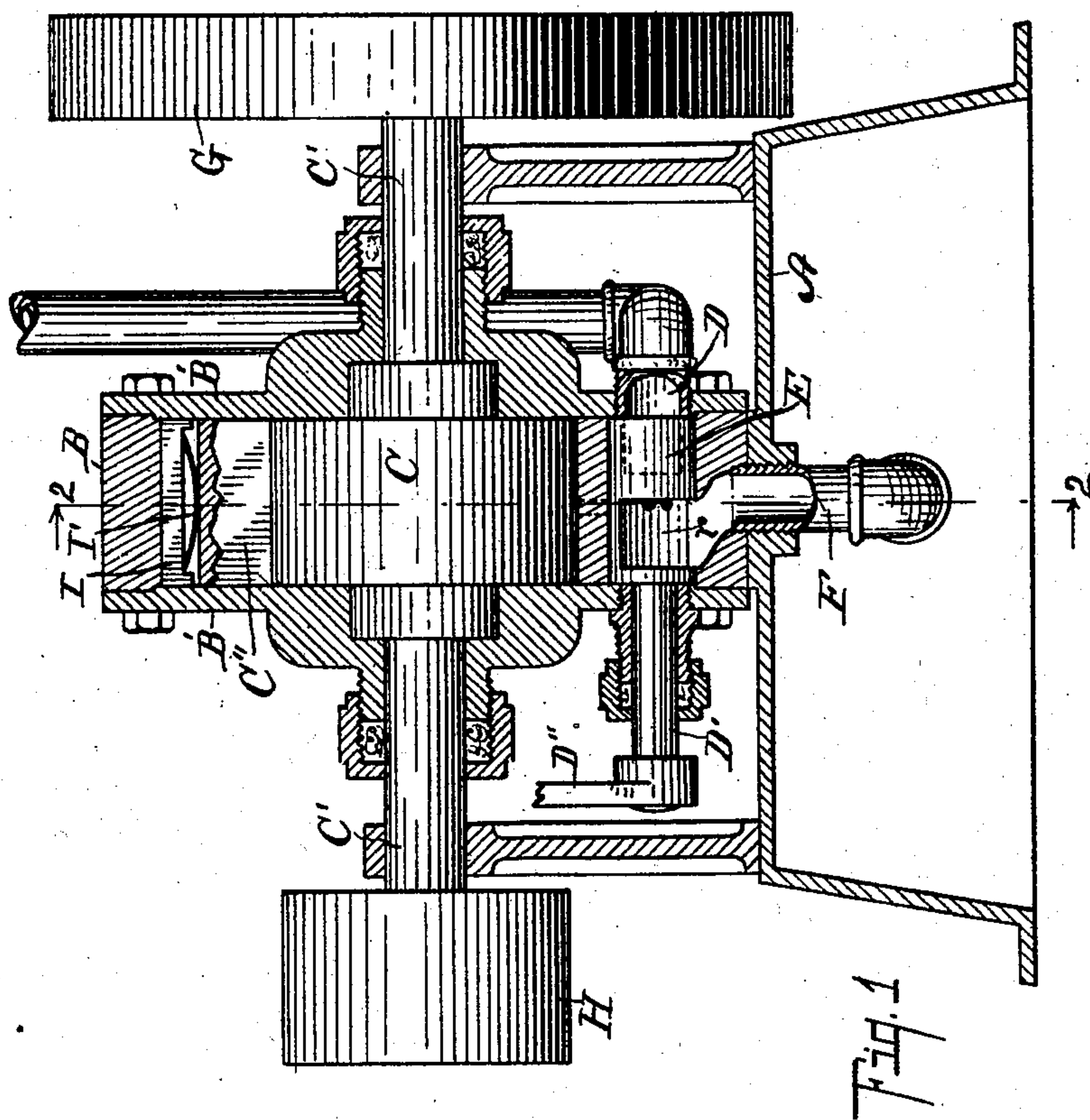
Patented Sept. 9, 1902.

G. SPEICE.  
ROTARY ENGINE.

Application filed Mar. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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*L. E. Wood,*

Inventor,

*George Speice*  
By *Fred L. Chappell*  
Att'y.

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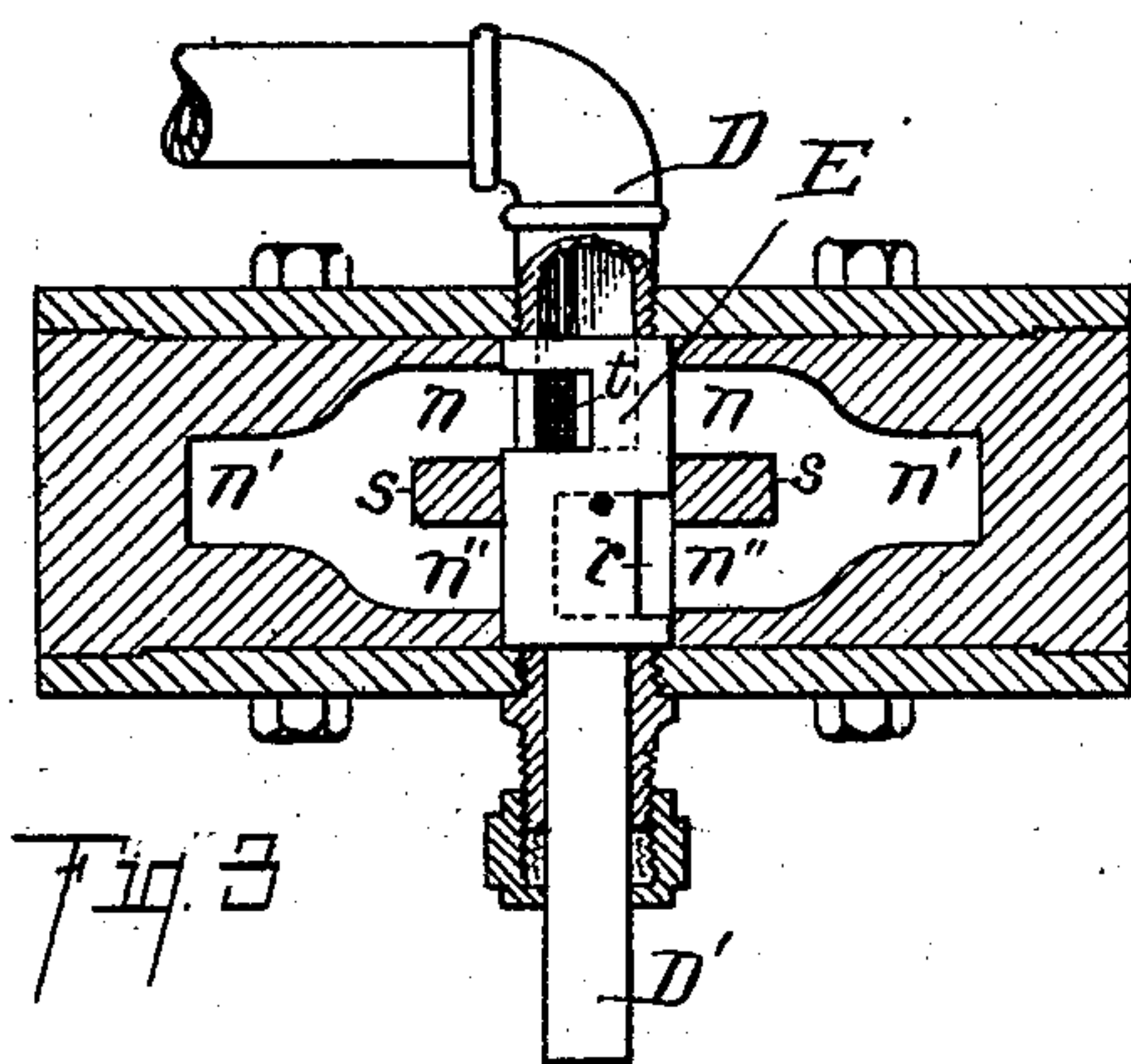
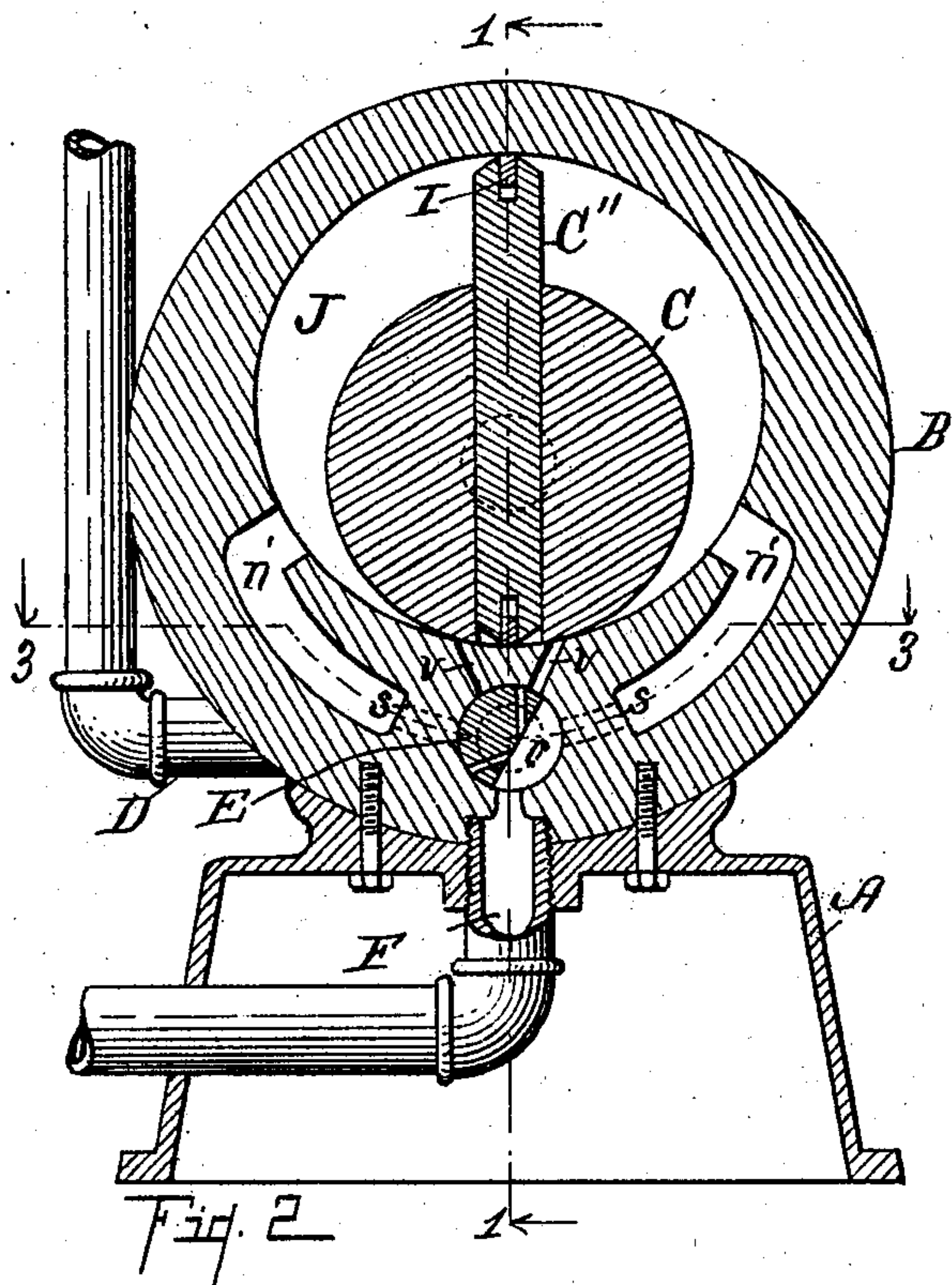
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2 Sheets—Sheet 2.



Witnesses.

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# UNITED STATES PATENT OFFICE.

GEORGE SPEICE, OF PARAGOULD, ARKANSAS, ASSIGNOR OF ONE-HALF TO CHARLES LOESCHE AND HERMANN E. STEINHEIMER, OF PARAGOULD, ARKANSAS.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 708,742, dated September 9, 1902.

Application filed March 20, 1901. Serial No. 52,064. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE SPEICE, a citizen of the United States, residing at the city of Paragould, in the county of Greene and State of Arkansas, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to improvements in rotary engines.

The objects of the invention are, first, to simplify the construction by reducing the number of movable parts; second, to provide in a rotary engine movable parts which vary their position only gradually, and therefore avoid any sudden strains; third, to provide a rotary engine which is easy to pack and to keep steam-tight; fourth, to provide in a rotary engine improved means of controlling the steam in relation thereto, so that the engine can be easily reversed and so, also, the expansive force of the steam can be utilized; fifth, to provide an improved rotary valve for use in rotary engines whereby the steam can be perfectly controlled and the engine easily reversed.

Further objects will definitely appear in the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in this specification.

The invention is clearly defined and pointed out in the claims.

A structure fully embodying my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical longitudinal detail sectional elevation of my improved engine, taken on line 1 1 of Fig. 2, the rotating head, valve, and pulleys being in full lines. Fig. 2 is a vertical transverse detail sectional elevation taken on a line corresponding to line 2 2 of Fig. 1. Fig. 3 is a sectional plan view taken on a line corresponding to line 3 3 of Fig. 2.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawing, A is a suitable base, preferably of hollow cast metal. On the top of this is formed a suitable saddle which receives the cylinder B of the engine, which is secured in position by suitable bolts or other means. The steam-space is formed in the upper portion of the cylinder and contains the revolving head C, which is eccentric thereto and is secured to the shaft C' C', which extends through suitable stuffing-boxes on each side of the cylinder, which stuffing-boxes also serve as bearings for the shaft. The driving-pulley H is on one end of the shaft, and the balance-wheel G is on the opposite end. Supports or brackets A' A' with bearings in their upper ends are provided for the shaft C'. The bore of the cylinder is not a true circle except in the lower part of the same, the upper part being in form the side of an ellipse. Through the center of the revolving head C is a piston C', which is adapted to reciprocate through a suitable recess in the head. This is provided with suitable packings I at its outer ends and is packed by suitable means, (not shown,) the packings I being held in position by suitable springs I'. With this peculiar form of cylinder when the head C revolves the piston C' will exactly fill the space in all positions and will reciprocate only slightly through the head to keep it in position.

I supply ports or passages for the steam  $n' n'$  to each side, which are divided into two parts at the bottom where they connect with the valve—viz.,  $n n''$ —a portion of the stock S being left between them. The valve E is provided, having a stem D', bearing a suitable lever D'', by which it is operated.

D is the inlet-pipe, and the inner end of the valve is provided with a port  $t$ , which connects the steam-pipe D with the passage  $n$  at either side, depending on the position of the valve when one side is connected, the other side being cut off. The opposite end of the valve is provided with a steam-port which connects with the exhaust-pipe F below, connecting the opposite side or port or passage  $n''$  with the exhaust when the opposite end of the valve admits steam on the opposite side,



so, by shifting the valve, live steam will be delivered to either side of the engine and be exhausted from the opposite side, making the engine completely reversible. Small ports *v* lead from the cylinder to permit the escape of exhaust-steam at the valve, which may be beyond the main port, which of course would tend to retard the engine if no port of escape were provided. The small port through the exhaust-valve connects to deliver this steam into the exhaust.

Having thus described my invention, I desire to state that the revolving piston and particular form of cylinder might be utilized with other styles of valves, though the particular style of valve I have adopted is of especial advantage in the manufacture of the same. Owing to the simplicity and compactness of my engine it is of especial value in small sizes, though it is of great advantage and utility in large sizes. However, a small engine of my design can be run at a high rate of speed, so that great power will be derived from a comparatively small engine.

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

1. In a rotary steam-engine, the combination of a cylinder; a rotary piston within the same; ports leading to each side of said cylinder to serve alternately as inlets or exhausts, said ports being divided into two separate passages at their outer ends; a valve having two passages, one of which connects one of said ports to the supply-pipe while the other connects the opposite port to the exhaust, alternately as the valve is shifted, coacting for the purpose specified.

2. In a rotary steam-engine, the combina-

tion of a cylinder, a cross-section of which is half-circular and half in the form of an ellipse, merging into each other; a rotary head eccentric thereto; a piston adapted to slide radially through the rotary head with suitable packings between it and the cylinder; ports leading to each side to serve alternately as inlets or exhausts, said ports being divided into two passages at their outer ends; a valve having two passages one of which connects one of said ports to the supply-pipe while the other connects the opposite port to the exhaust alternately as the valve is shifted, coacting for the purpose specified.

3. In a rotary steam engine, the combination of a cylinder, a cross-section of which is half-circular and half in the form of an ellipse, merging into each other; a rotary head eccentric thereto; a piston adapted to slide radially through the rotary head with suitable packings between it and the cylinder; ports leading to each side to serve alternately as inlets or exhausts, said ports being divided into two passages at their outer ends; a valve having two passages one of which connects one of said ports to the supply-pipe while the other connects the opposite port to the exhaust, alternately as the valve is shifted; and an auxiliary exhaust leading into the main exhaust from the exhaust side of the cylinder-chamber, coacting for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE SPEICE. [L. S.]

Witnesses:

WM. POINDEXTER,  
A. P. COX.