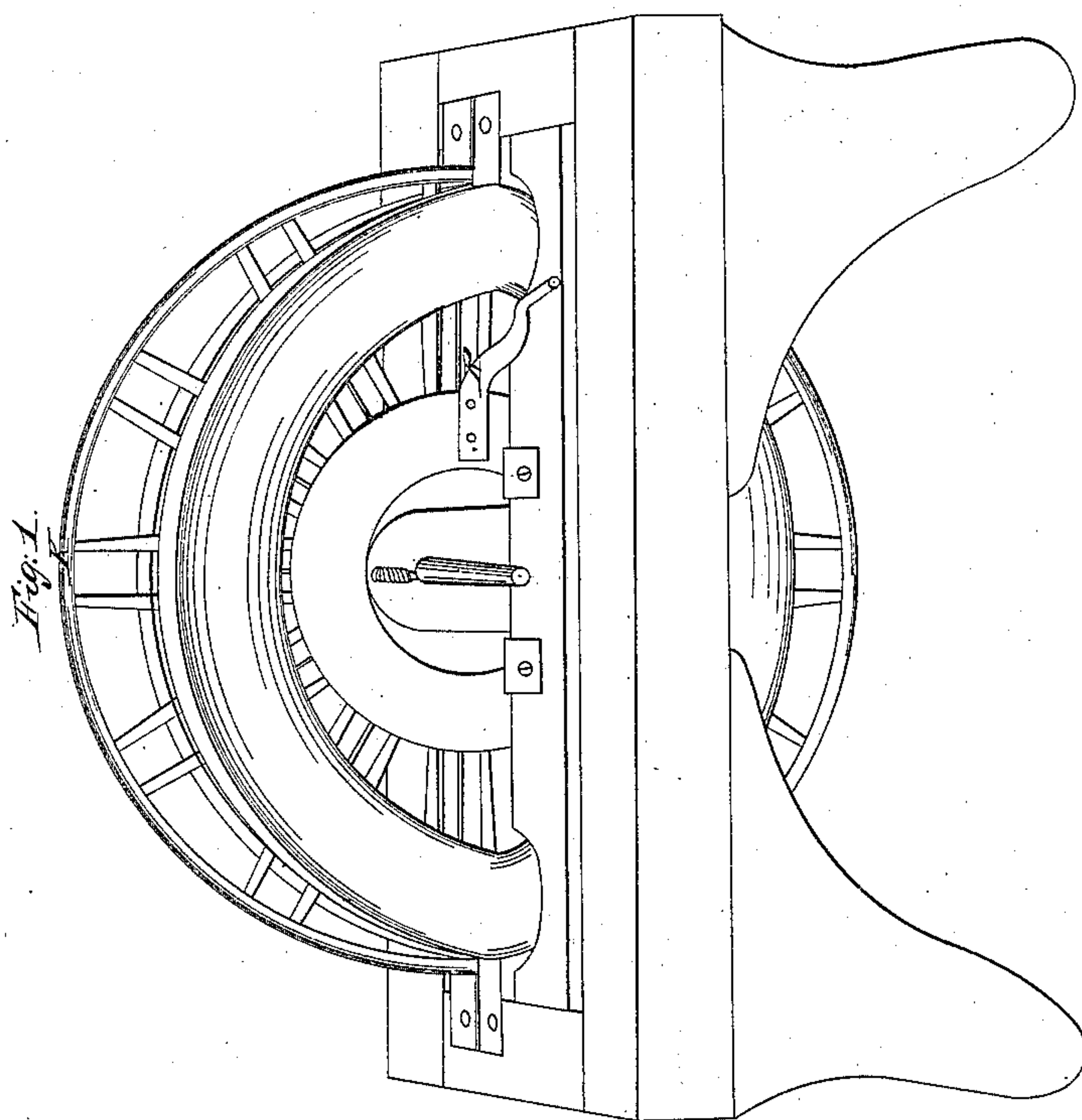


*Merriam & Cushing,  
Rotary Steam Engine.*

*3 Sheets-Sheet 1.*

*N<sup>o</sup> 48,577.*

*Patented July 4, 1865.*



*Witnesses:*

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C. D. Topping*

*Inventor:*

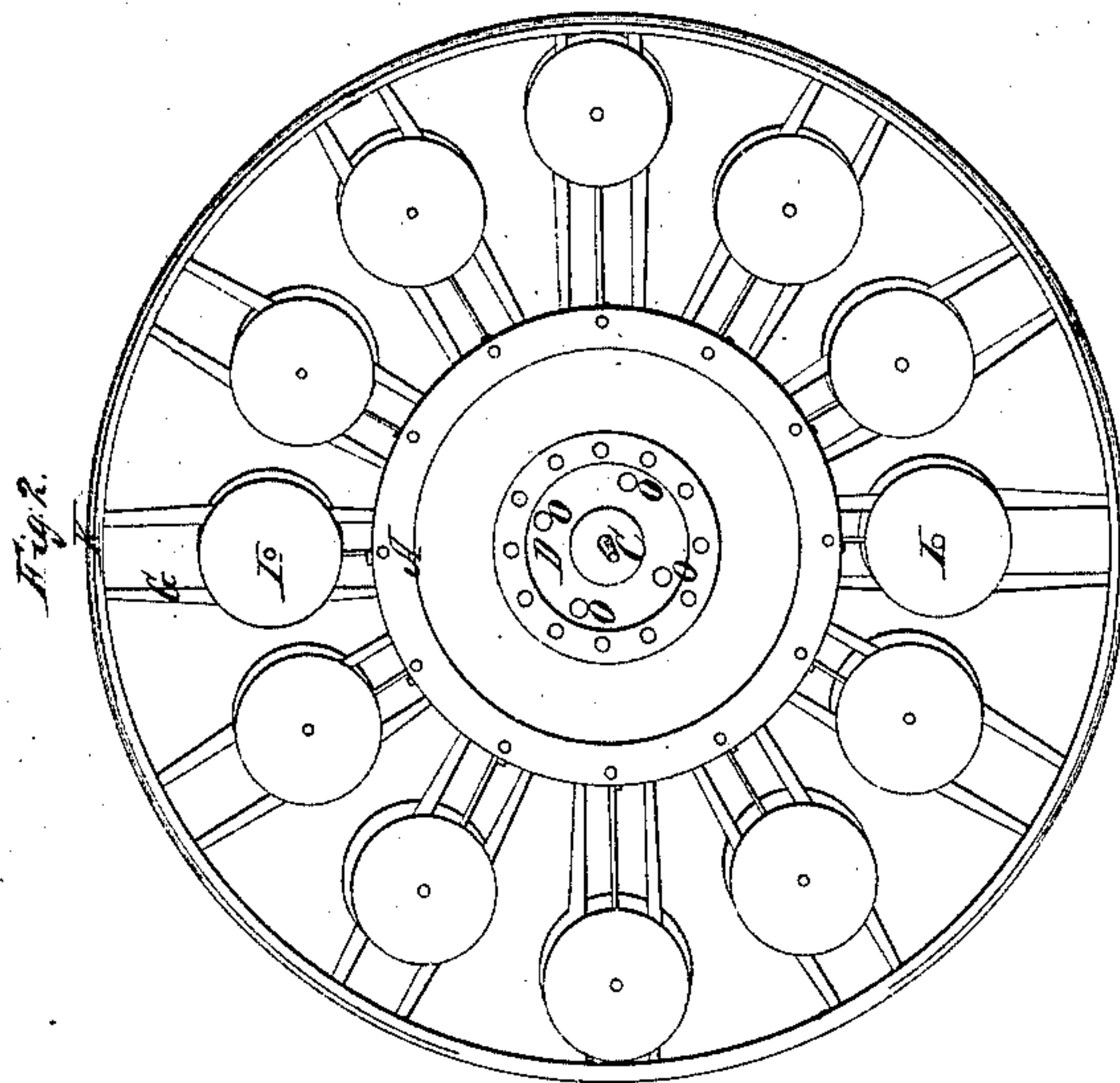
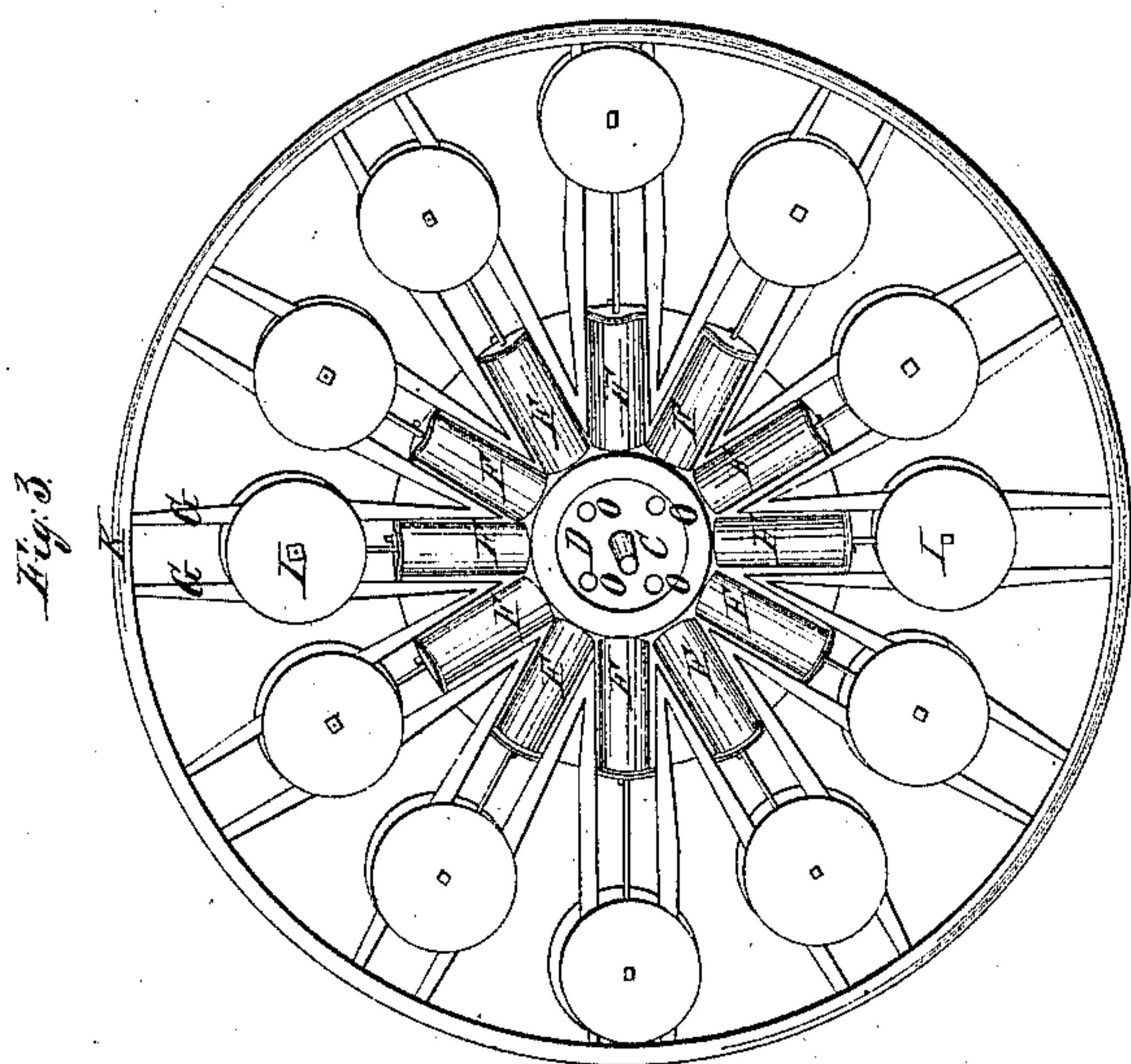
*Truman Merriam  
James Cushing*

3 Sheets-Sheet 2.

*Merriam & Cushing,*  
*Rotary Steam Engine.*

*No 18,577.*

*Patented July 4, 1865.*



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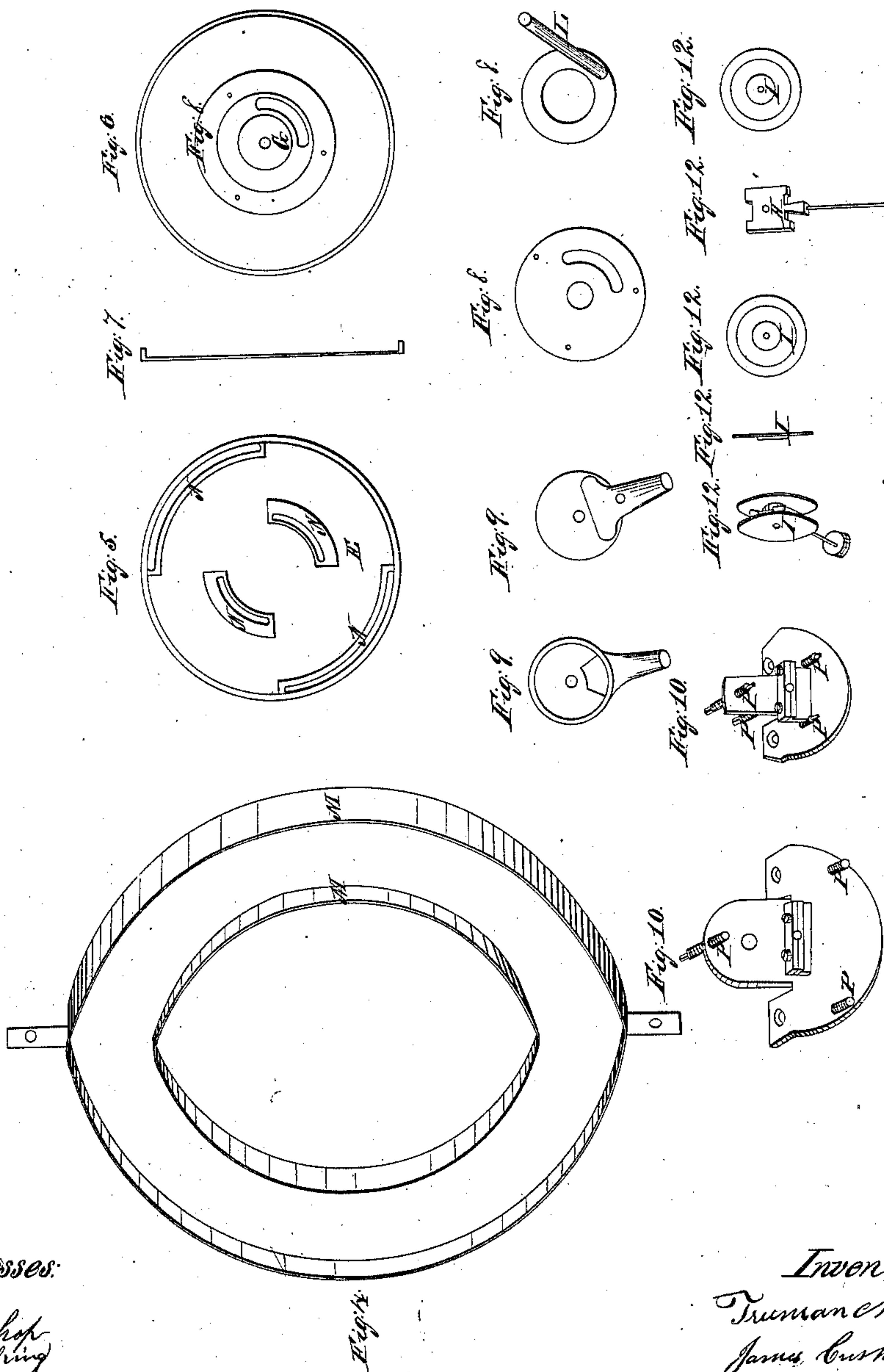
*Truman Merriam*  
*James Cushing*

3 Sheets-Sheet 3.

*Merriam & Cushing,*  
*Rotary Steam Engine.*

*No 48,577.*

*Patented July 4, 1865.*



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*Inventor:*

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*James Cushing*



# UNITED STATES PATENT OFFICE.

TRUMAN MERRIAM AND JAMES CUSHING, OF WATERLOO VILLAGE, WIS.

## IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. 48,577, dated July 4, 1865.

*To all whom it may concern:*

Be it known that we, TRUMAN MERRIAM and JAMES CUSHING, of the village of Waterloo, in the county of Jefferson and State of Wisconsin, have invented a new and useful Improved Numerical Reciprocating Rotary Steam-Engine; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the engine. Fig. 2 is a view of the face-plate. Fig. 3 is a transverse view of Fig. 2. Fig. 4 is a view of the semicircle. Fig. 5 is a view of the steam-chest. Fig. 6 is a transverse view of the chest. Fig. 7 is an edge of the steam-chest. Fig. 8 is parts of the oscillating joint and steam-pipe. Fig. 9 is the exhaust cap and pipe. Fig. 10 is the boxes and plates with set-screws. Fig. 12 is the cross-head and friction-truck in pieces and together.

Letter A, Fig. 2, shows the ports in the face-plate; letter C, Figs. 2 and 3, the shaft; D, the drum; O O O O, the apertures through the drum; F F F, the cylinders; G G, the sliding rods; I I, the friction-trucks; K, the rim; H and J J J J, Fig. 12, the friction-trucks in pieces and together. Letters M M, Fig. 4, show the inside and outside flanges of the semicircles; N N N N, Fig. 5, the circular raised apertures in the steam-chest; E, the depression in the steam-chest; L, Fig. 8, steam-pipe; R, Fig. 1, the lever on the chest; P P P, Fig. 10, the set-screws in the plates on the boxes.

The shaft C is so constructed that it rests on the boxes, Fig. 10, with male and female centers at each end of the shaft. On the shaft is the drum D, Fig. 3, on which rests the end of the twelve cylinders F F F, more or less, to suit the maker, and modify the power of the engine. The cylinders F F are attached to the back side of the face-plate, Fig. 3. The sliding rods G G are connected to the cylinders F F, and extend to the rim K, upon which the cross-head H, Fig. 12, with the friction-trucks attached, slide, the piston rod and head being attached to the cross-head H, with one or two friction-trucks, I I I, as the velocity may require, on each side, to run on the semicircles M M, by which the rotary motion and power are obtained.

The steam-chest, Fig. 5, rests on the shaft C, with circular-raised apertures N N, adapted to the ports A A, in the face-plates, Fig. 2, so as to admit the steam into the cylinders F F at each end, alternately producing the outward and inward motion of the piston and friction-trucks I I on the flanges M M of the semicircles, Fig. 4, the steam alternately entering and escaping at the four centers as the ports pass them, and finally escaping into the depressed part E of the steam-chest, Fig. 5, thence through the aperture O O in the drum D into the exhaust cap and pipe, Fig. 9.

On the transverse view of chest, Fig. 6, is the oscillating steam-joint, Fig. 8, to which is attached the steam-pipe L, that conducts the steam into the steam-chest, Fig. 5, and admits the chest to oscillate one-quarter and reverse the motion of the engine by means of the lever R on the chest.

In the plates on the boxes, Fig. 10, are the set-screws P P P, by which the steam-chest, Fig. 5, is adjusted to the face-plate, Fig. 2, as also the exhaust cap and pipe, Fig. 9, to the drum D.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The arrangement of the cylinders and pistons upon a revolving drum on a shaft, in combination with a face-plate and ports, and adapted to circular apertures in a stationary steam-chest, so that a constant pressure of active steam may be alternately applied to the pistons, thereby increasing the leverage and speed, as herein set forth and described.

2. The two semicircles, in combination with friction-trucks on a cross-head, by which, in connection with the movement of a common piston, rotary motion and power are obtained, as herein set forth and described.

3. The steam-chest, with an oscillating joint in such a peculiar arrangement and adaptation to a face-plate as will admit steam to cylinders and permit the chest to revolve one-quarter, and thereby reverse the motion of the engine, as herein set forth and described.

TRUMAN MERRIAM.  
JAMES CUSHING.

Witnesses:

A. B. BISHOP,  
CHS. BOWMAN.