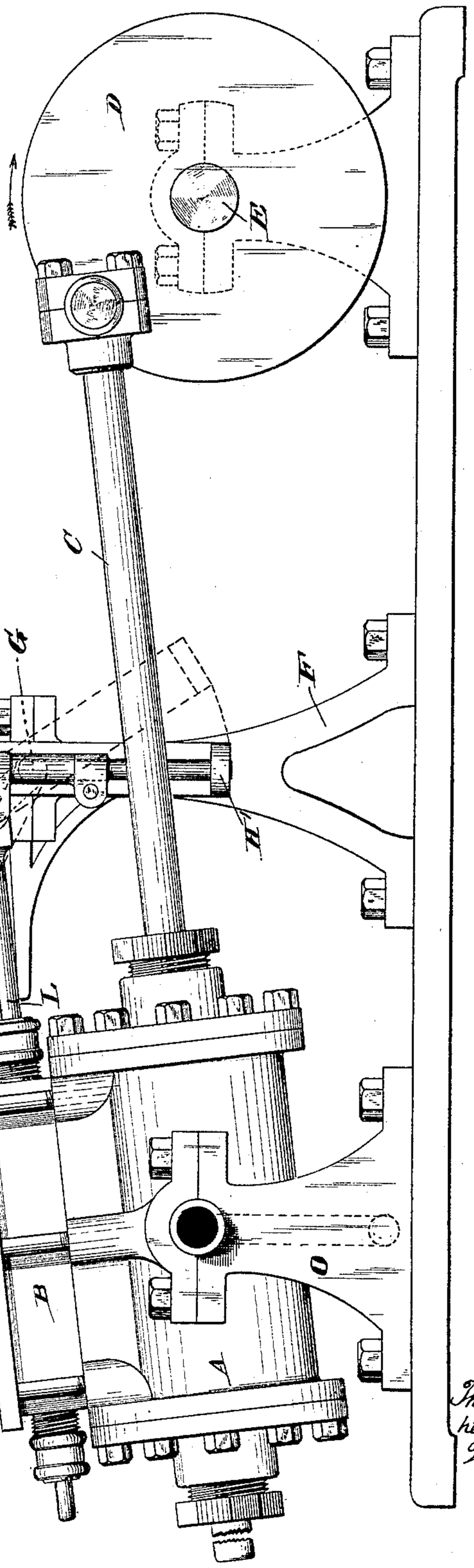
(No Model.) 2 Sheets—Sheet 1.

T. J. BAUM.

VALVE GEAR FOR OSCILLATING ENGINES.

No. 339,132. Patented Apr. 6, 1886.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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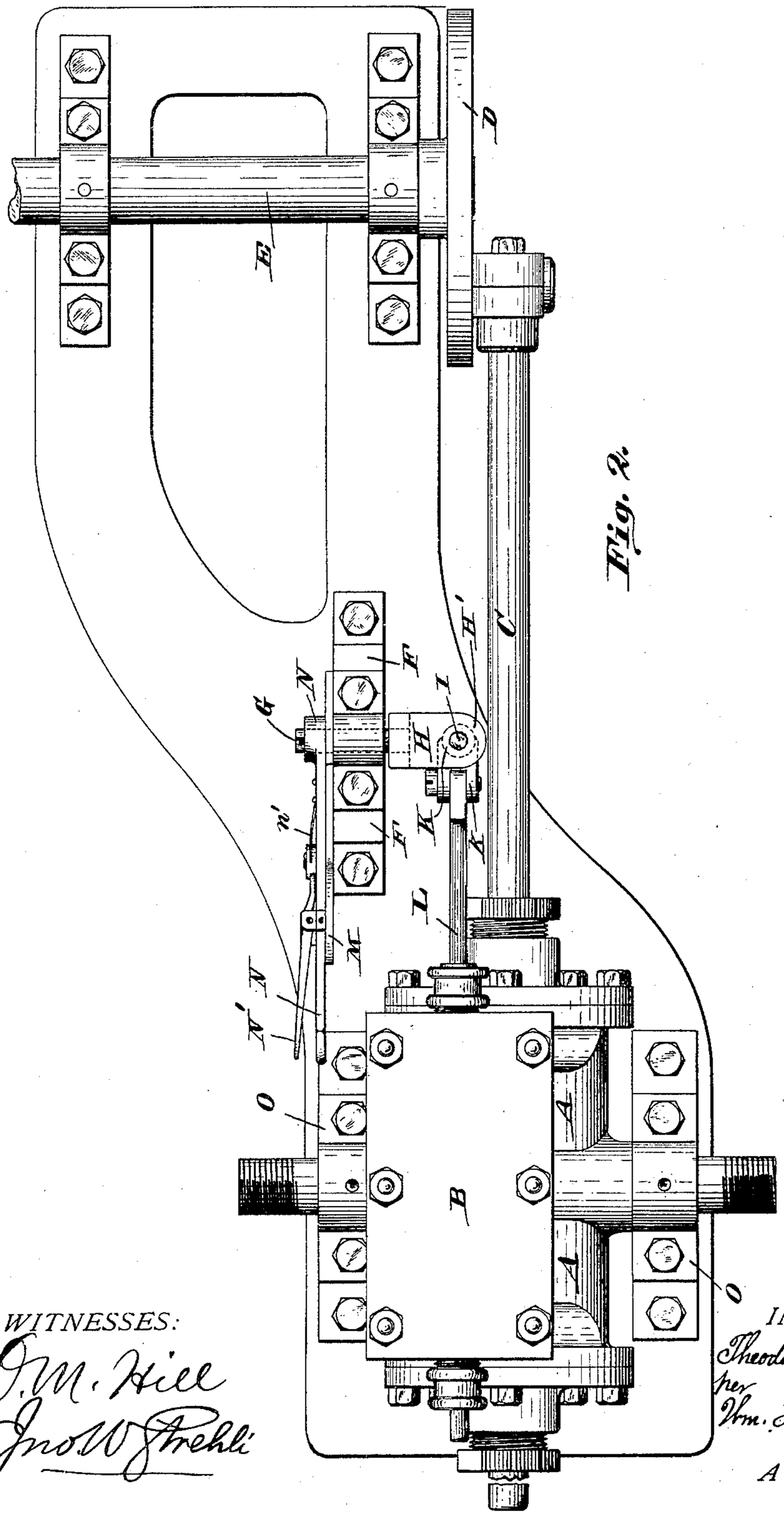

Fig. 2.

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UNITED STATES PATENT OFFICE.

THEODORE J. BAUM, OF CINCINNATI, OHIO.

VALVE-GEAR FOR OSCILLATING ENGINES.

SPECIFICATION forming part of Letters Patent No. 339,132, dated April 6, 1886.

Application filed December 7, 1885. Serial No. 184,886. (No model.)

To all whom it may concern:

Be it known that I, THEODORE J. BAUM, a citizen of the United States, and a resident of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Valve-Gears for Oscillating Engines, of which the following is a specification.

My invention provides a valve-gearing for oscillating engines by means of which the engine may be quickly and easily reversed.

In the accompanying drawings, Figure 1, Sheet 1, is a side elevation of an oscillating engine provided with my improved valve-motion. Fig. 2, Sheet 2, is a top view of the engine shown in Fig. 1.

The oscillating cylinder A is mounted on trunnions in the usual manner. The trunnions are hollow, and, preferably, one serves as the steam-pipe and the other as the exhaust-pipe.

Steamways, cast or otherwise formed in or on the cylinder, serve as conduits for the passage of the steam between the trunnions and the steam-chest. The steam-chest B is placed on the top of the cylinder A. The valve within the chest is preferably an ordinary three-port slide-valve. The peculiar movement of the engine makes it desirable to have the valve-stem extend through both ends of the steam-chest. The piston-rod C is journaled to the fly-wheel or crank D, which latter is centered on the operating-shaft E. A rock-shaft, G, is journaled to the upright bracket F, preferably at or near the top of the latter, as shown. The rock-shaft G may be otherwise supported; but it is preferable to have the bracket F or its equivalent. The yoke H is centered on the end of the rock-shaft G, and rigidly secured thereto. The yoke H holds between its arms H′ H′ the guide-rod I. A sleeve, K, surrounds the guide-rod I, and is arranged to slide upon it. The sleeve K is pivoted to the end of the valve-stem L, preferably through the medium of the projecting tongue *k*. The arc M is rigidly secured to a suitable support, preferably to the bracket F, as shown. This arc is provided with several openings, as m', m^2, and m^3, the latter not being shown in the drawings, as it is hidden by the lip *n* of lever N. This lever N is rigidly attached to the rock-shaft G, immediately adjacent to the arc M. The lever N is preferably provided with a lip, *n*, which surrounds the arc and acts as a guide. The lever N is provided with a pin, which fits into any one of the openings m' m^2 m^3, and when in either of these openings holds the lever N in that particular position. This pin is held in position by the spring n', and is released by the hand-lever N′, which is grasped at the same time with the lever N.

The mode of operation of this feature of my invention is as follows: With the valve-gear in the position shown in Fig. 1, the engine moves in the direction indicated by the arrow. After passing its highest point, the end of the piston-rod begins to drop, and with it the front end of the cylinder is lowered. This throws the steam-chest B forward onto the valve-stem L, which latter is thereby relatively forced into the steam-chest, moving the valve. By the time the piston has reached the end of its stroke the valve has been thrown. This admits steam to the opposite side of the piston, which makes its return-stroke. In this return-stroke in the upward oscillation of the cylinder the valve is changed in a manner similar to that already described. The sleeve K, sliding on the rod I, prevents the valve-stem from being broken. If, now, the lever N be moved to the opening m', the yoke H and rod I will take the position indicated by dotted lines in Fig. 1. This throws the valve back, and when steam is turned on the engine moves in the direction opposite to that indicated by the arrow. As the front end of the cylinder is depressed toward the end of the stroke, the steam-chest is thrown forward, as in the first movement described; but instead of the valve-stem remaining stationary and the steam-chest encroaching upon it as it did before, we now find that the inclination of the rod I is such that the sleeve K in descending upon it draws the valve-stem L forward more rapidly than the steam-chest moves in that direction; hence the valve is drawn forward, admits steam behind the piston, and forces it forward. Thus it seems that with the lever N in the opening m^3, as shown in the drawings, Fig. 1, the engine moves in the direction of the arrow, and when the lever is put in the opening m', as indicated

by dotted lines, the engine is reversed. When the lever N is placed at a point intermediate between these two—viz., m^2—the engine stops.

When it is not desired to have a reversible oscillating engine, the yoke H may be bolted to the bracket F in either of its two operative positions and the lever N and arc M dispensed with.

In the drawings one engine only is shown. When two engines are united, the rock-shaft G is preferably continued over to the other engine, and the second yoke H is secured to the rock-shaft in a different position from the first yoke H, depending upon how the engines are coupled.

Another feature of my invention consists as follows: The exhaust-port, instead of passing out of the end of one of the trunnions, is continued down through the standard of the said trunnion and opens out below, substantially as shown in dotted lines in Fig. 1. This arrangement of the exhaust obviates the necessity of an extra stuffing-box at the point where the trunnion containing the exhaust is connected to the exhaust-delivery pipe.

While the features of my invention are preferably employed together, one or more of said features may be employed without the remainder, and in so far as applicable one or more of said features may be applied to engines other than the one herein specifically mentioned.

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

1. In an oscillating engine, a stationary rod, I, in combination with a sleeve, K, pivoted to the end of the valve-stem, substantially as and for the purposes specified.

2. In an oscillating engine, the rod I, attached to the rock-shaft G by appropriate intervening device, in combination with the sleeve K, valve-stem L, lever N, and arc M, substantially as and for the purposes specified.

3. In an oscillating engine, the combination of a hollow trunnion provided with a port communicating in all positions of the engine with an exhaust-delivery conduit in the standard supporting the trunnion, substantially as and for the purposes specified.

THEODORE J. BAUM.

Attest:

JNO. W. STREHLI,

O. M. HILL.