

(No Model.)

3 Sheets—Sheet 1.

P. E. BERTHIER.
STEAM ENGINE.

No. 506,765.

Patented Oct. 17, 1893.

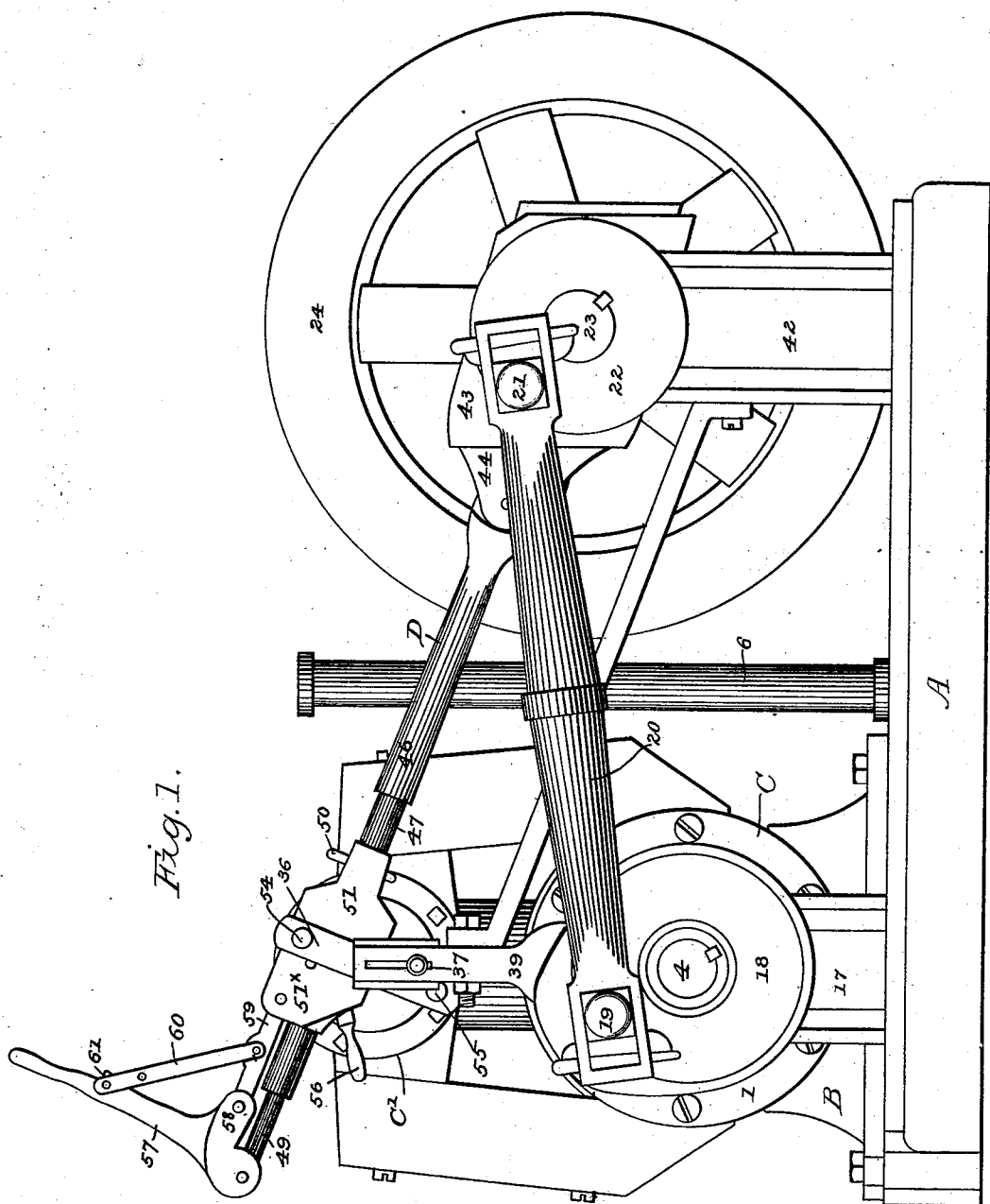


Fig. 1.

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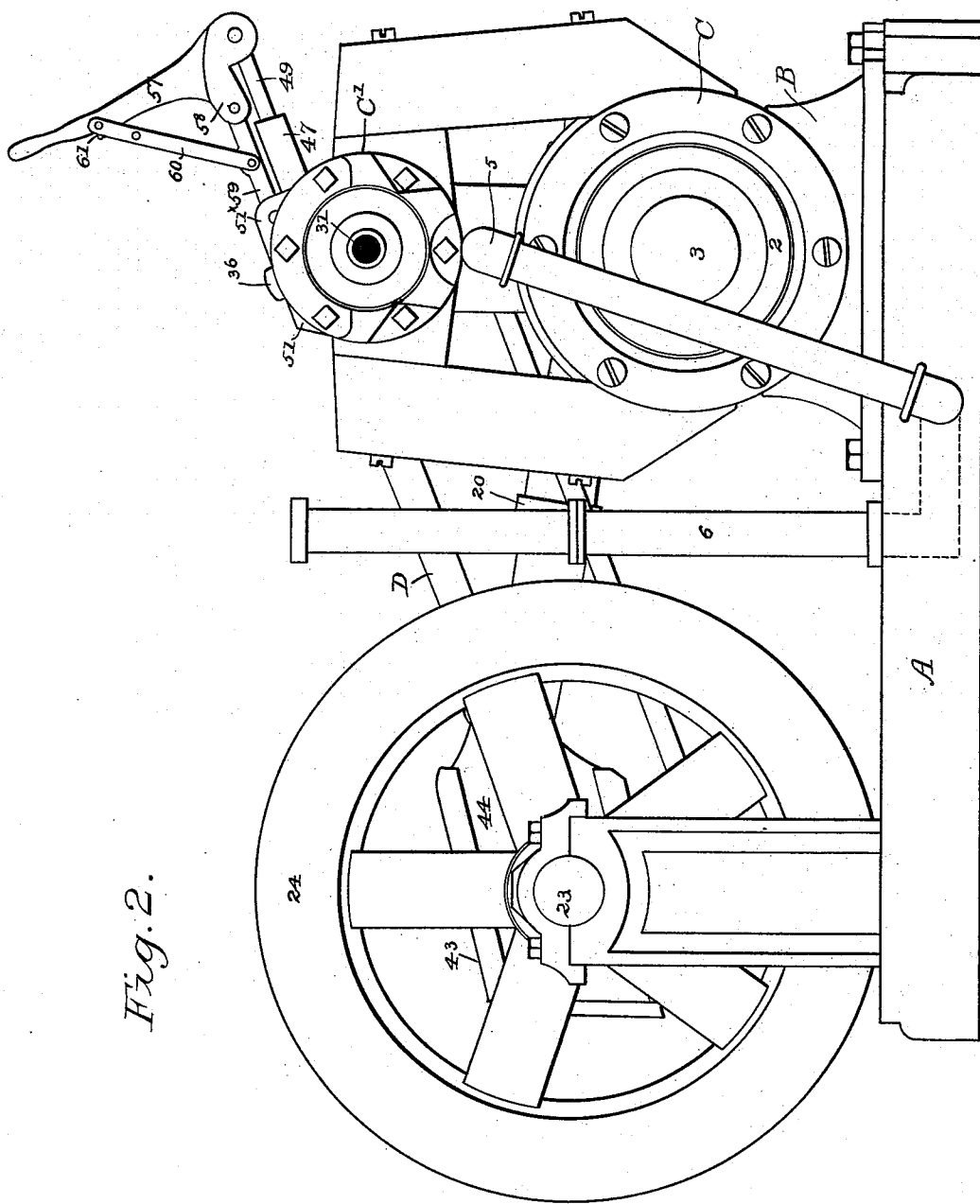


Fig. 2.

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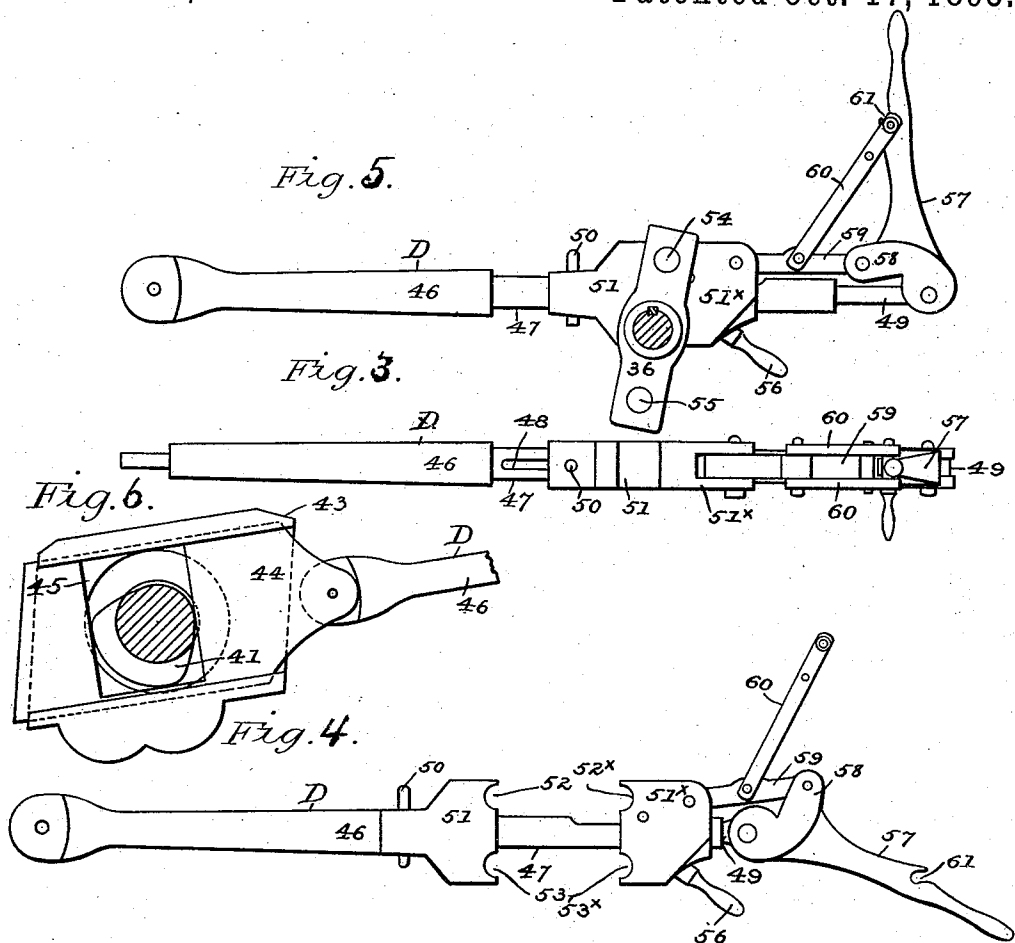
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3 Sheets—Sheet 3.

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STEAM ENGINE.

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UNITED STATES PATENT OFFICE.

PETER E. BERTHIER, OF LAKELAND, LOUISIANA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 506,765, dated October 17, 1893.

Application filed March 11, 1893. Serial No. 465,529. (No model.)

To all whom it may concern:

Be it known that I, PETER E. BERTHIER, a citizen of the United States, residing at Lakeland, in the parish of Pointe Coupée and State of Louisiana, have invented certain new and useful Improvements in Steam-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to improvements in rotary engines of that class provided with oscillating-pistons working in the inclosing cylinder, and the object is to provide improved valve-gear whereby the operation of the engine may be conveniently reversed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of the engine. Fig. 2 is a side elevation taken from the opposite side from that shown in Fig. 1, and showing the steam and exhaust pipes. Fig. 3 is a plan view of the eccentric-rod. Fig. 4 is a side view of the eccentric-rod showing the clamping-slides open. Fig. 5 is a side view, partly in section, showing the slides engaging the yoke or link frame on the valve-shaft of the steam-chest. Fig. 6 is a side view of the eccentric connections and mechanism.

A designates the bed-frame of the engine of such proportions and area as to take and support the engine as hereinafter specified. On one end of the bed-frame is mounted and secured a support B, on which is the cylinder C, made part of the support if desired. The cylinder heads 1, 2, are formed with glands 3, in which the shaft 4, of the piston has its bearings. This shaft 4 may be passed through the glands and have duplicate connections with the driving-wheel. From the neck of the cylinder leads the exhaust-pipe 5, which for convenience, is carried down into the bed, and opens into the vertically arranged pipe C, substantially as shown. The shaft of the piston is extended, and journals in a standing-box 17, and has mounted on the end a crank-disk 18, in which is a wrist-pin 19, having connected thereto, the end of the connect-

ing-rod 20, the other end of which is suitably connected to a wrist-pin 21, on a crank-disk 22, on the shaft 23, carrying the driving-wheel 24, by which the engine may be connected to the mechanism to be moved, by either gearing or belting. The crank-disk 18 is arranged with the longest diameter vertically and the connecting-rod is attached to the upper portion thereof, so that as the piston is oscillated the driving-shaft is rotated.

C designates the steam-chest, mounted on the cylinder, and having steam-ports leading therefrom into the cylinder; and a live steam pipe 31, centering therein from the steam source and exhaust ports, leading into the exhaust pipe. In the heads of the steam-chest is journaled the oscillating valve-shaft 34. The valve shaft is extended and has fixed thereto a yoke or link-frame 36, the outer bar of which is provided with a stud-bearing 37, journaled in a steam box 38, in a standard 39, projected from the bearing-cap 40, over the piston shaft on the stand-box thereof.

D designates the piston-rod for the valve-shaft which I now proceed to describe. On the driving shaft is mounted an eccentric 41, which operates the eccentric-rod. To the standard 42, of the driving-wheel shaft, is fixed a flanged plate 43, in which is fitted a slide-piece 44, having an opening 45, in which the eccentric rotates, alternately engaging the vertical walls of the opening in the slide, and reciprocating it accordingly. To the slide piece 44 is jointed the eccentric-rod 46, having its outer portion 47 reduced in diameter, and made hollow, and formed with a longitudinally arranged slot 48. In the bore of the port 47 is fitted a pull-rod 49, having a cross-pin 50 the ends of which project through the slot 48, and engage in a sliding clamping-piece or block 51, which slides on the reduced portion of the eccentric-rod and is formed with upper and lower recesses 52, 53, which take respectively, on the upper and lower pins, 54, 55 of the link-frame 36. On the outer portion of the part 47 is fitted to slide, a clamping-piece or block 51^x which has upper and lower recesses 52^x, 53^x, registering with the recesses in the sliding-block 51, so that when the two pieces are brought together one or the other of the pins of the link-frame is held, as in a bearing, between them. The sliding block

51^x, is provided with a handle 56, by which the parts may be lifted and put on the respective pins of the link-frame. On the end of the pull-rod is fulcrumed a lever 57, having an arm 58, jointed to a link or rod 59, having its other end jointed to the sliding-block 51^x; and to the rod 59 is hung a link 60, the upper end of which engages in a notch 61, in the lever 57, whereby when the sliding-blocks are moved together, they are held locked in that position.

It will be perceived by reference to the drawings, that when the lever 57 is moved upward the sliding-blocks are pulled toward each other, and that when the lever is turned down, the blocks are moved apart, in which relation the valve is not operated. It will also be perceived that by the connection of the blocks to the upper or lower pin of the link-frame, the motion of the engine will be reversed.

While I have shown and described my reversing gear associated with an engine having an oscillating valve and piston of particular construction, it will be perceived that my improved reversing gear is applicable to any oscillating valve in the class.

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

1. The eccentric-rod, provided with means to connect it to the eccentric, sliding blocks on the rod formed with recesses on their abutting-faces, a lever to move the sliding-blocks to and from each other, and a locking means to hold the lever and maintain the blocks together substantially as and for the purpose specified.

2. The eccentric-rod formed hollow at one end, and having a longitudinal slot in the hollow portion, a pull-rod in the hollow part of the rod, a sliding block formed with end-re-

cesses, connected to the pull-rod through the slot in the eccentric-rod, a second sliding-block having a recess in its end face, a lever jointed to the end of the pull-rod, and a connecting link jointed to the lever and to the second sliding-block, and a link jointed to the connecting link and arranged to engage with the lever and hold it, substantially as and for the purpose specified.

3. The combination of the steam-chest, the oscillating valve arranged therein, a link-frame on the shaft of the valve provided with upper and lower cross-pins, the driving wheel having an eccentric on its shaft, an eccentric-rod connected thereto, oppositely arranged sliding-blocks on the eccentric-rod having registering recesses to take and hold the cross-pins of the link-frame, a lever to move the sliding-blocks to and from engagement, and a locking means to hold the lever substantially as described.

4. The combination with the steam-chest, the oscillating valve therein, and the eccentric on the driving-shaft, of the hollow eccentric-rod formed with a longitudinal slot, a pull-rod in the eccentric-rod provided with a cross pin projected through the slot in the rod, a sliding-block on the eccentric-rod fixed to the pin of the pull-rod and formed with a recess on its end face, a second sliding-block on the eccentric-rod formed with a recess, a lever fulcrumed to the end of the pull-rod, a connecting link between the second block and the lever, and a link to hold the lever when the blocks are together, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PETER E. BERTHIER.

Witnesses:

OMER SAMSON,
URBIN DAVENSBURG.