No. 639,854. Patented Dec. 26, 1899.

J. A. HYTER.

STEAM ENGINE.

Application filed Mar. 23, 1899.)

(No Model.)

FIG. 1

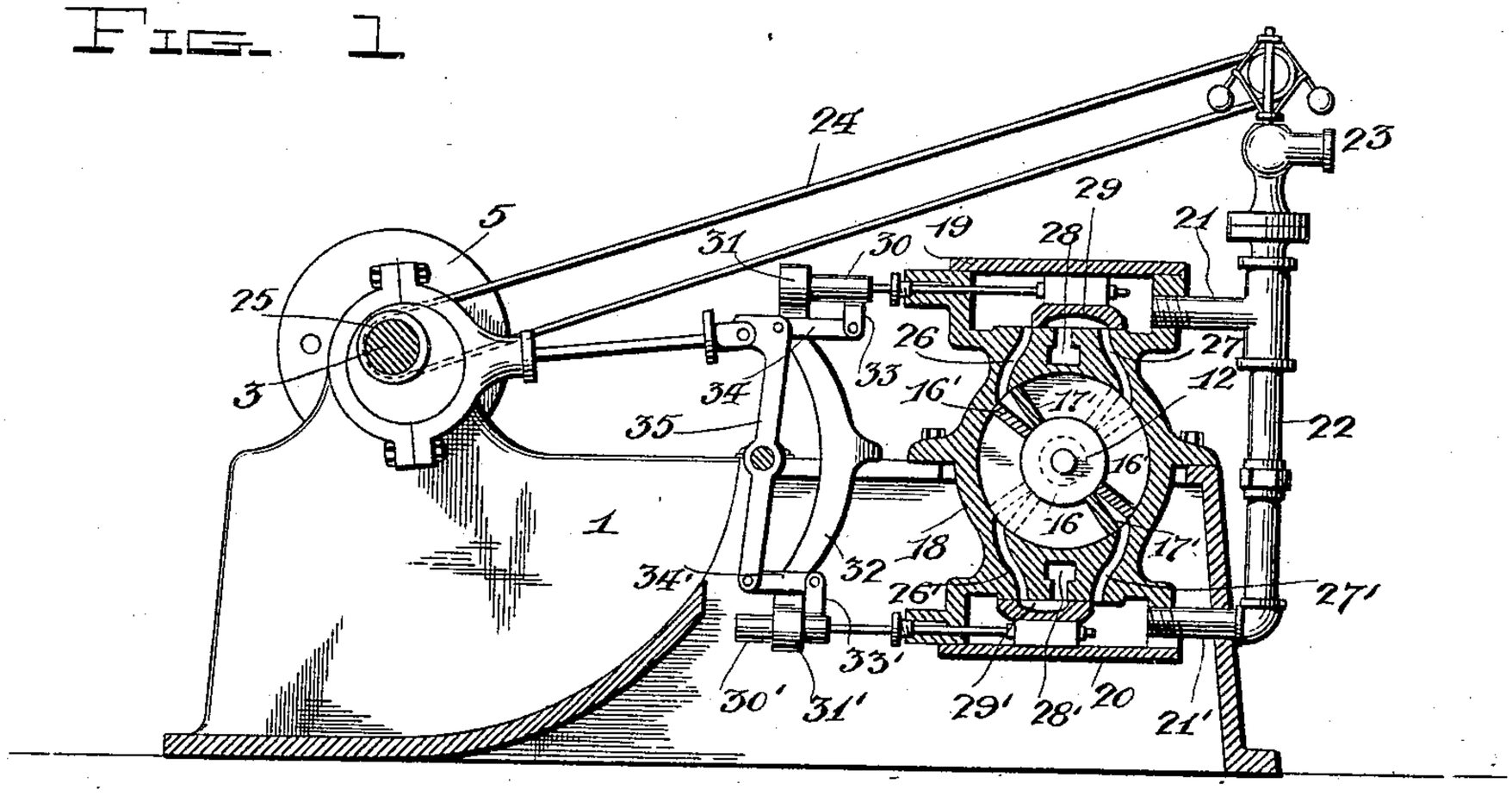
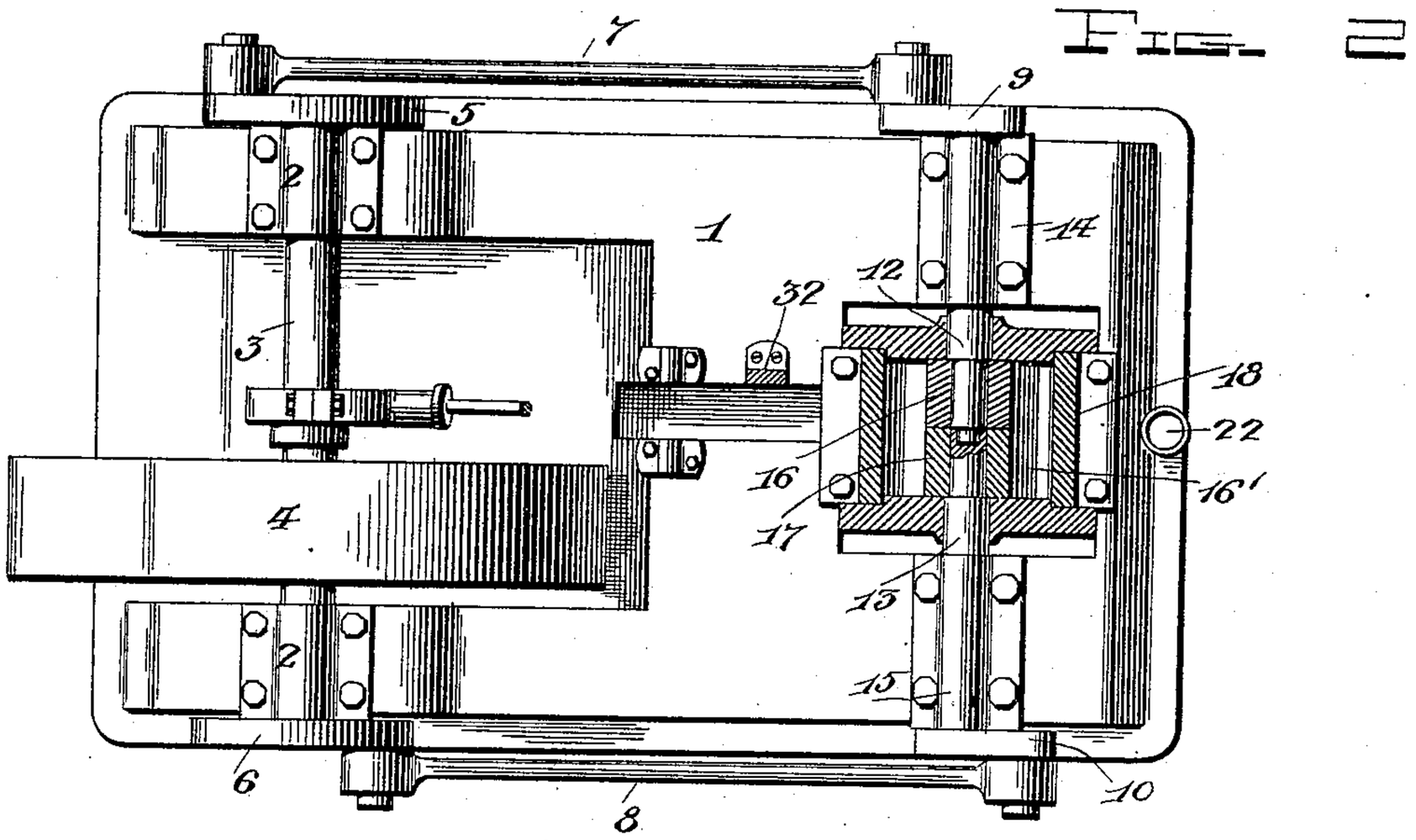


FIG. 2



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN A. HYTER, OF FOSTORIA, OHIO, ASSIGNOR OF ONE-HALF TO CHARLES E. HYTER, OF BRADNER, OHIO.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 639,854, dated December 26, 1899.

Application filed March 23, 1899. Serial No. 710,171. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. HYTER, a citizen of the United States, residing at Fostoria, in the county of Wood and State of Ohio, 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.

My invention relates to an improved double-acting vibrating compressed air or steam engine; and the object is to increase the efficiency and motor-power by simplifying and improving the construction of the machine.

To these ends the invention consists in the construction, combination, and arrangement of the several parts of the device, as will be hereinafter more fully described, and particularly pointed out in the appended claim.

In the accompanying drawings, the same reference characters indicate the same parts of the device.

Figure 1 is a side elevation, partly in section, of an engine embodying my invention. Fig. 2 is a top plan view, also partly in section, of the same.

In the drawings, 1 denotes the cast-metal frame, provided with the bearings 2 2 to receive the driving-shaft 3, provided with the usual balance-wheel 4 and the crank-disks 5 and 6, to which the connecting-rods 7 and 8 are pivoted, and which extend to the oppositely-disposed cranks 9 and 10, fixed on the alined shafts 12 and 13, journaled in the bearings 14 15 on the frame 1.

16 and 17 denote the intermeshing vibrating pistons, fixed on the contiguous ends of the piston-shafts 12 and 13, and they are provided with the radial overlapping piston-blades 16′ and 17′, which have a bearing in the cylinder 18. This cylinder is provided with duplicate steam-chests 19, which are supplied with steam or compressed air through the branch pipes 21 21′, communicating with the main steam-pipe 22, which is provided with the usual throttle-valve and the governor-valve 23, operated by the belt 24, coacting with the pulley 25 on the main shaft 3.

26, 27, and 28 denote one set of steam inlet and exhaust ports, and 29 denotes the slide-valve, the stem of which terminates in a guide-block 30, working in a guide 31 on the brace 32, fixed to the frame.

The guide-block 30 is formed with a lateral arm 33, which is connected to the rod 34, pivoted to the upper end of a rocking lever 35, operated by the usual eccentric, rod, strap, and the eccentric fixed on the main driving-shaft 3.

26′, 27′, and 28′ denote the other set of inlet and exhaust ports, and 29′ a coacting slide-valve, the stem of which terminates in a guide-block 30′, working in a guide 31′ on the lower end of the brace 32. The guide-block 30′ is provided with a lateral arm 33′, which is connected to the rod 34′, pivoted to the lower end of the rocking lever 35.

In operation, the steam is admitted between the contiguous piston-blades through the ports 26 and 27′, which tends to separate them and at the same time close up the opposite piston-blades in line with the ports 27 and 26′. The slide-valves have now changed their position to open the ports 27 and 26′, while the ports 26 and 27′ are placed in communication with their respective exhaust-ports. The steam now enters through the ports 27 and 26′, thereby separating the contiguous piston-blades and driving them back to their former position, and so on, the movements of the pistons and their respective shafts being communicated to the main driving-shaft through the medium of the connecting-rods 7 and 8.

It will of course be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent of the United States, is—

In a double-acting vibrator-engine, the main driving-shaft 3, the crank-disks 5 and 6, and the connecting-rods 7 and 8; in combination with the oscillating shafts 12 13 and their cranks 9 and 10, the cylinder 18 provided with duplicate inlet and exhaust ports and coacting slide-valves, their stems, the rocking lever 35 connecting said stems, a single eccentric

mounted on the main driving-shaft and operatively connected to said lever and adapted to simultaneously reciprocate said valves in opposite directions and the overlapping piston-blades fixed to the contiguous end of said oscillating shafts, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN A. HYTER.

Witnesses:
VINCENT FISHER,
CHARLES E. BAKER.