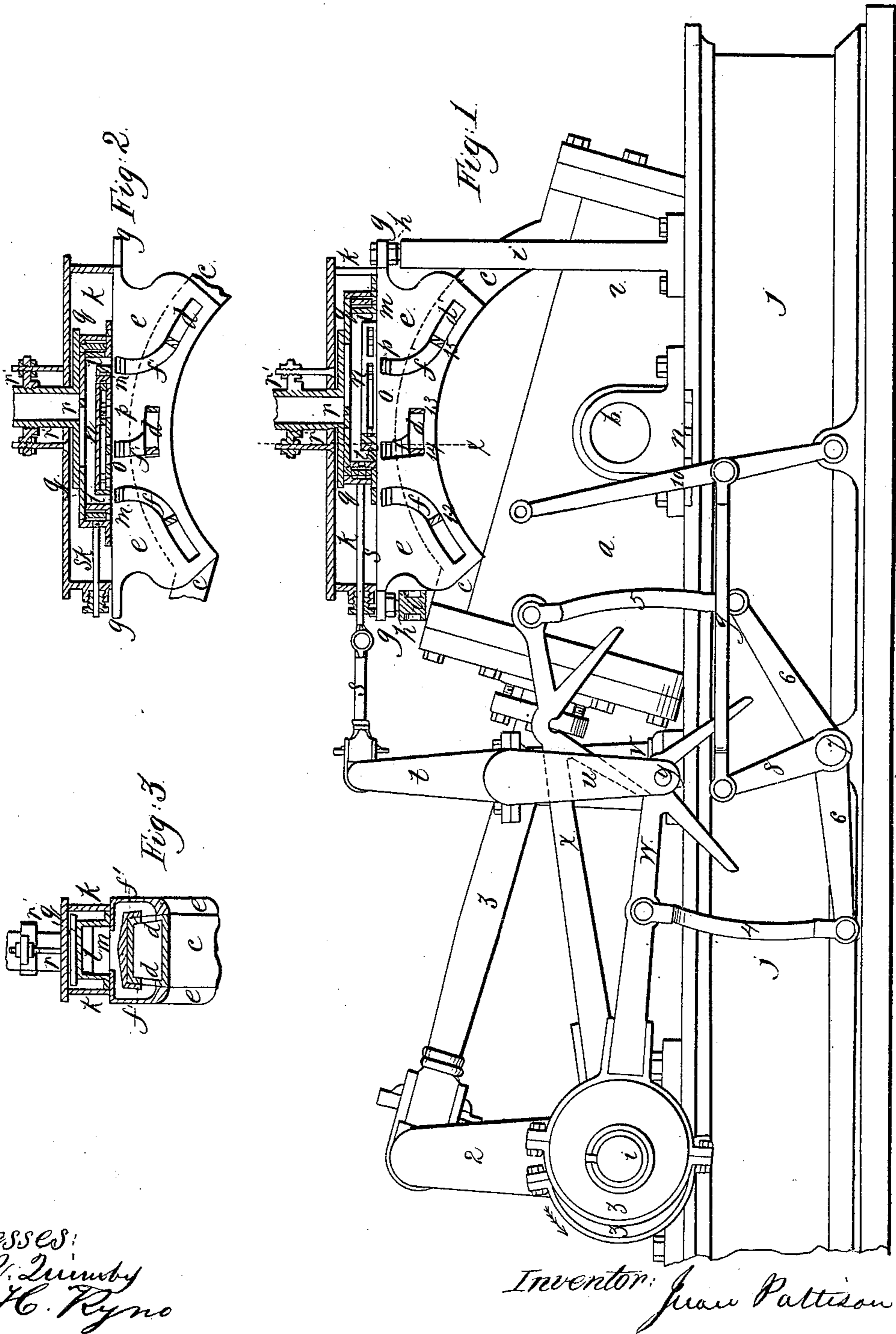


J. Pattison,
Oscillating Steam Engine.
N^o 14,204. Patented Feb. 5, 1856.



Witnesses:
T. R. Lundy
C. H. Ryno

Inventor: Jean Pattison

UNITED STATES PATENT OFFICE.

JUAN PATTISON, OF BROOKLYN, NEW YORK.

OSCILLATING STEAM-ENGINE.

Specification of Letters Patent No. 14,204, dated February 5, 1856.

To all whom it may concern:

Be it known that I, JUAN PATTISON, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Oscillating Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

To enable others skilled in mechanical engineering to construct and use my improvement, I herewith proceed to describe its construction and operation.

Figure 1 represents a side elevation of the engine, with a sectional view of the steam chest, the hollow valve and the ports; the plane of the section being passed vertically through the side wings or laps of the saddle *e e*. Fig. 2 is a longitudinal and vertical section of the steam chest, showing the valve and ports in a reversed position from that exhibited in Fig. 1. Fig. 3 is a cross section through *x x* of the steam chest, valve and ports.

a, a represent the cylinder vibrating or oscillating upon its trunnions *b*; an arched steam pipe *c c* forming a circle, of which the trunnion *b* is the center, is secured by bolts to the extremities of the upper side of the cylinder and is armed with two lateral slots which traverse the whole width of the pipe. The portion of the steam pipe between the two slots is solid, interrupting thus the communication between the two branches of the pipe, each one making an independent passage with the end of the cylinder it is attached to.

The steam pipe very slightly tapers toward the top of the pipe, as shown in an exaggerated manner in the cross section Fig. 3, for the purpose of compensating their wearing and of facilitating the adjustment of the saddle. The latter is composed of 3 parts, cast either in one or in 3 pieces which are, the top piece and the two side pieces, or flaps or wings; the whole of the saddle is set upon the steam pipe *c, c*, covering the greatest portion of its top and lateral sides. The saddle with its superincumbent weight, however, does not rest upon the steam pipe, which would cause too great a friction, besides, its being more liable to derangement, but it is secured to the arched frames *i, i*, by means of its flanges *g g* and the double adjusting screws *h, h*. The

frame *i, i* is attached to the bed *j* of the engine.

To complete the description of the saddle I have to mention three slots at the top of the saddle, communicating by means of internal passages with 3 other slots of the face in contact with the pipe of the lateral wing of the saddle. The slots of the wing are of such a shape and at such distances from each other, that two neighboring slots correspond exactly to those of the steam pipe.

To the upper part of the saddle is secured the steam chest *k* containing a hollow slide valve *h*, with its steam tight coverplate 9, the exhaust and the supply steam pipes. The hollow slide valve, worked inside the chest by the arm *t*, attached to a rock shaft, and the valve rod *s s* answers the purposes of distributing exhausting, stopping, reversing and cutting off the steam at either motion of the crank, as it will appear from the following description of its construction.

The valve as represented in the different sections in Figs. 1, 2 and 3, shows a quadrangular bar, armed with rims or flanches, which rest with steam tight friction upon the upper face of the saddle; the box or valve may be said to be composed of 3 compartments the first having an opening *h* on the top through which the steam escapes into the exhaust pipe *r*, and communicating with those at the bottom, indicated by letters *m, m*; the two other compartments have each a slot *o* and *p* which communicate with the interior space of the steam chest surrounding the valve. The slide valve is covered by the plate 9, which is armed with the exhaust pipe *r*, and is kept steam tight at the top and bottom by the collar and bolts 7, 7', adjusting the whole with a close fitness.

In the drawing Fig. 1, the steam valve is shown under three movements: one indicated by the blue coloring when the crank is situated as in the drawing that is the piston on its half stroke and turning in the direction of the arrow; the exhaust being through the aperture and the port *d* and *f'* passage *l* and pipe *r'*: the second is indicated by yellow coloring, the crank having passed its center; the exhausting still continuing as before through port *f'*, but through *d'* instead of *d*, and charging through port *f* and aperture *d* from steam chest 12 and 13 showing the portion of the apertures; the third is indicated by red coloring, the crank having past the second

center the exhausting continues through port f' and aperture d , where the charging is from the steam chest through the opening p of the valve and the port f'' into aperture d' , 14 and 15 showing their apertures; the crank on passing its centers, the cylinder being thus horizontal the apertures d d' are closed, being behind the divisions between f' f'' of the wings of the saddle. Finally t and u represent a rock shaft sustained by the column v , s is a spindle attached to the eccentrics 3, 3, which by moving of the hand lever 10 to the other extreme of its travel, would in conjunction, with the rod g , lever 15 8, b , b , and links 4 and 5, raise the rod w and lower x down to y and reverse the motion.

In the reversed portion of the valve Fig. 2, the hand lever 10, is drawn back to the extreme check of the offset 11; the exhaust continuing to be through the valve.

The advantages gained by the above described improvements, besides the simplicity of the construction and easy adjustability of the various parts, consist, in the mode of receiving the steam through the arched pipe surmounting the cylinder instead of admitting the same through and at the trunnions, by which means the friction is considerably reduced, bearing also the motion free and the regulation of the part most convenient. In ordinary oscillating engines,

the passages and valves, all move bodily with the cylinder, rendering the motion and operation dependent of each other, which creates great inconvenience in case of repair. Considering also that the weight of the cylinder and all parts connected therewith, rests upon the hollow trunnions the wear of which, combined with the heating produced by an increased development of surfaces in friction, and the corrosive action of steam inside, render more liable to derangement. I also consider the slide valve as an useful attribute as it obviates the necessity of a second valve to cut off, more particularly so in its application to stationary engines, when the motion is to be reversed. The improved oscillating engine is alike adaptable and capably efficient for locomotive, stationary or marine purposes.

Having thus fully described my improvement, what I claim as my invention and desire to secure by Letters Patent is:

The arrangement of parts, viz: the arched steam pipe, saddle, hollow valve and chest, substantially as described, for the passage and distribution of steam in cylinders of oscillating steam engines.

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Witnesses:

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