J. H. Towne.

Oscillating Steam Engine.

No. 3,878. Patented Jan. 10, 1845.

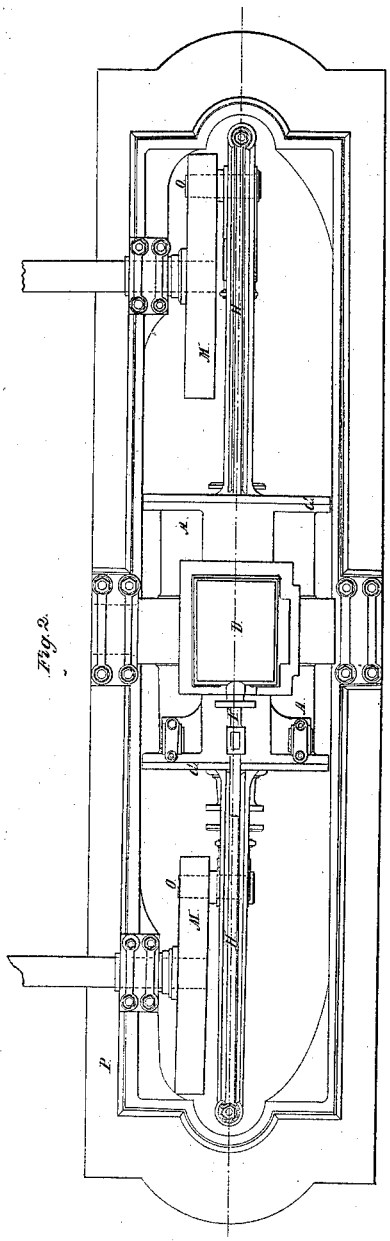

Fig. 2.

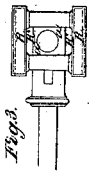

Fig. 3.

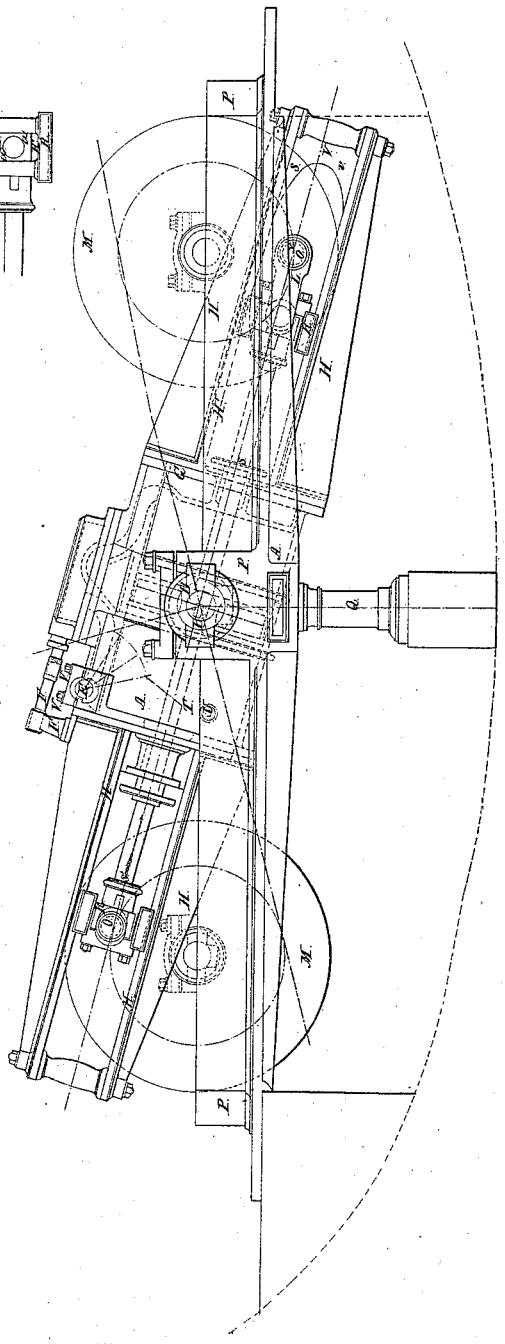

Fig. 1.

UNITED STATES PATENT OFFICE.

J. H. TOWNE, OF PHILADELPHIA, PENNSYLVANIA.

METHOD OF ADAPTING THE VIBRATING STEAM-ENGINE TO TWO CRANK-SHAFTS.

Specification of Letters Patent No. 3,878, dated January 10, 1845.

To all whom it may concern:

Be it known that I, J. HENRY TOWNE, civil engineer, of the city of Philadelphia, in the State of Pennsylvania, have made a new and useful Improvement in the Manner of Constructing Reciprocating-Cylinder Steam-Engines, which improved engine is intended for the driving of two shafts at the same time in opposite directions, by which it is rendered especially applicable to the driving of two screw or other oblique propellers for the propelling of vessels, but which may be applied to any other purpose requiring similar motions; and I do hereby declare that the following is a full and exact description thereof.

My engine is to have a vibrating cylinder, sustained upon suitable trunnions, through which, if desired, the steam may be admitted to the cylinder; but it may, if preferred, have other provisions for the admission of steam, which need not be described, as it is not intended to make claim to any particular manner of doing this, but to use such as are already known, or which may be hereafter devised.

In my engine there are to be two piston rods in a line with each other, which rods are to pass through the two cylinder heads, each head being provided with a stuffing bag. The piston rods are each to be connected with a crank at their outer ends, so that each shall actuate the shaft of a wheel for propelling, or for any other purpose, and cause said shaft to revolve in opposite directions. One of these connections of piston rod with its crank is to be made by aid of a link, or of a sliding box, admitting of a slight degree of lateral play, to prevent cramping as the cranks revolve.

In the accompanying drawing, Figure 1, represents a side elevation, and Fig. 2, a top view, of my engine.

A, A, is the steam cylinder, which vibrates upon trunnions, B, B. These trunnions may be made hollow, as at C, to constitute them steam passages. P, P, P, represents a frame, which may be of cast-iron, and which sustains the cylinder and its appendages. Q, is a standard for supporting the frame.

The line R′, R′, may represent that of the inside of a vessel.

D, shows a valve, or steam chest, containing a common slide valve.

E, is a rock shaft which is to be worked by the motion of the cylinder. F, the valve stem, and F′, its guide. T, U, V, V, are levers for giving motion to the valve; but as this part of the apparatus may be variously modified, according to the size of the engine—and other circumstances, I do not intend to limit myself to the particular arrangement represented in this part thereof.

G, G, are the cylinder heads, provided with stuffing boxes, as usual. H, H, H, H, are guides which may be cast in one piece with, or be firmly attached to, each head of the cylinder, the inner edges, H′, H′, of these guides receive the ends of the cross heads R, R. The stability of these guides is a point which must not be neglected, as it is very important to prevent any transverse strain from affecting the piston rods, and stuffing boxes; this transverse strain may sometimes be very great; as, for example, in the case of one propeller striking the ground, or any other obstacle offering great resistance to its motion, while the other is unobstructed.

R, R, are the cross heads, which are secured upon the piston rods, S, S, and work between the inner edges H′, H′, of the guides; provision, of course, being made for rendering this part adjustable so as to compensate for wear.

L, is a short link, one end of which is attached to one of the cross heads, R, and the other to one of the crank pins, O, for the purpose of preventing cramping, as above named. At the end of the guides within which the link, L, traverses, a curve, V, V, is formed, which serves to prevent the link from deviating from its proper position, and constrains the two cranks to pass the dead points simultaneously. For this link, a slotted cross head, or some analogous device, might be substituted, as shown in Fig. 2, where R″, R″, represents a slot in one of the cross heads, in which slot a box *a*, *a*, embracing the crank pin, may slide, and allow the necessary lateral motion thereto; the link, L, is, however, much to be preferred. M, M, are wheels to which the crank pins, O, O, may be attached, when thought proper.

The piston which I intend to use is of the ordinary kind, and the two piston rods should be in one continuous piece, the more perfectly to insure the remaining in the same straight line.

Having thus fully described the nature of my improvements in the vibrating cylinder steam engine, and shown the operation thereof, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The manner in which I have arranged the same, so as to connect two piston rods, proceeding from one piston, to two driving shafts, for the purpose of turning them, simultaneously, in opposite directions, as set forth.

2. I likewise claim, in combination with the two piston rods, the connecting of one of them to one of the crank pins, by means of a link, or some equivalent device, allowing of the amount of lateral motion necessary to enable both the cranks to revolve with perfect freedom.

I do not claim the passing of two piston rods through the two heads of a piston as in itself new, this having been previously done, but I limit my claim to the combination and arrangement by which I effect the object that it was the purpose of this invention to accomplish, as set forth, and applied to the vibrating cylinder steam engine.

J. H. TOWNE.

Witnesses:
JOHN V. MERRICK,
W. JONES.