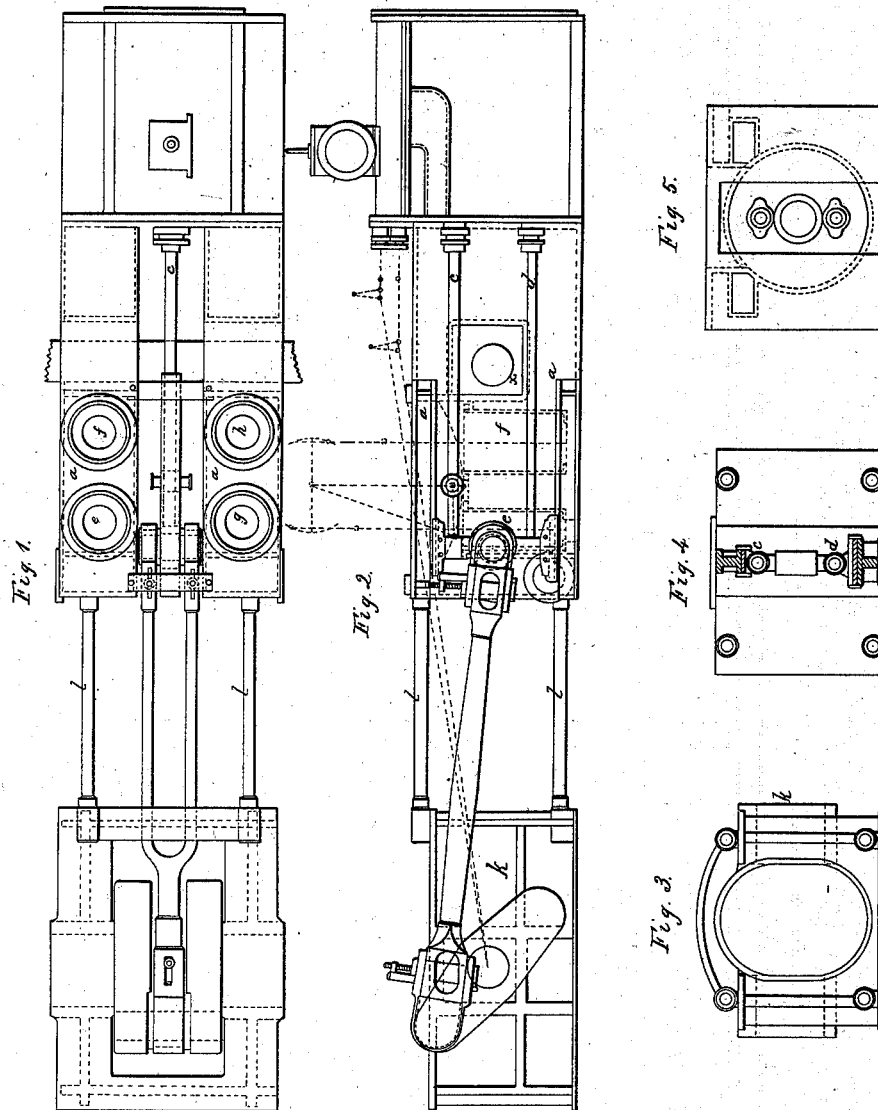


J. Baird,
Reciprocating Steam Engine,
N^o 47,377,
Patented Apr. 25, 1865.



Witnesses;
Wm. A. Lockwood
James A. Baird

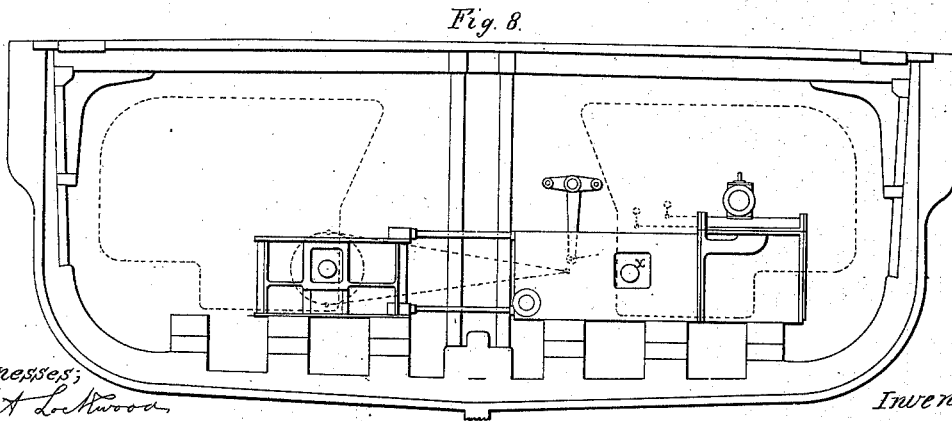
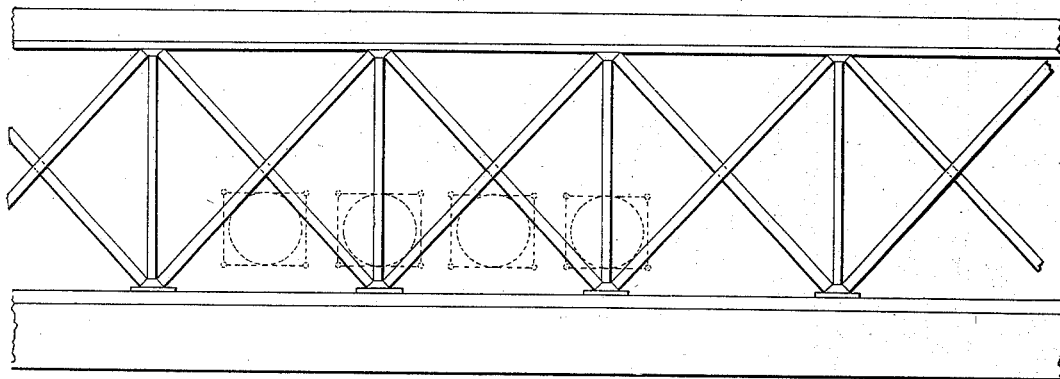
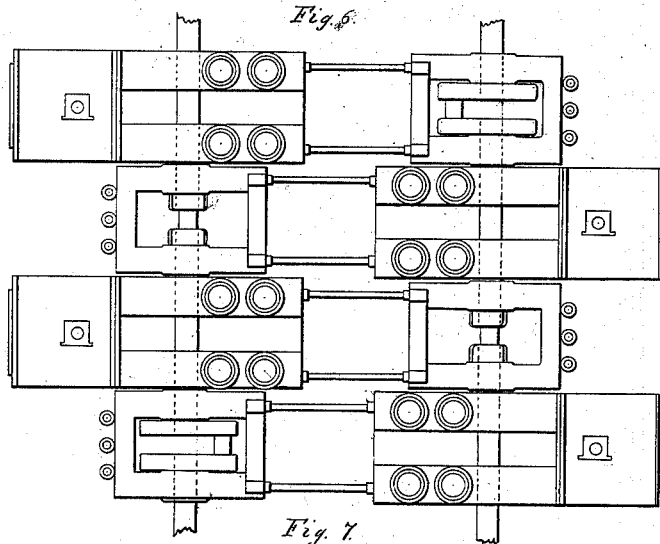
Inventor;
John Baird

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UNITED STATES PATENT OFFICE.

JOHN BAIRD, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 47,377, dated April 25, 1865.

To all whom it may concern:

Be it known that I, JOHN BAIRD, mechanical engineer, of the city, county, and State of New York, have invented certain new and useful Improvements in Horizontal Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, when taken in connection with the drawings.

In the drawings, Figure 1 is a plan or top view of my improved engine. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation of the casting supporting the pillow-blocks. Fig. 4 is an end elevation of part of the framing near the cylinder, showing the cross-head with the slides in section. Fig. 5 is also an end elevation, showing the cylinder, piston-rod, stuffing-boxes, &c. Fig. 6 is a plan of four of my engines as applied according to my arrangement to the working of two propellers. Fig. 7 is a sketch of the same in end elevation, as also of a longitudinal diagonal framing in the ship; and Fig. 8 is a side elevation of the same engines, with a sketch of the boilers and of the section of the vessel.

My improvements in horizontal engines have been devised principally with reference to the use of the engine in propeller-vessels, although some of them are applicable to other purposes, and they may be divided into three heads, to wit, first, an improved construction of the low-pressure horizontal engine; second, an improvement in the same, peculiarly adapting it for use in vessels with two propellers, one located on each side of the stern-post; and, third, an arrangement of several such engines whereby a longitudinal framing may be conveniently introduced into the vessel and space saved.

By reference to the drawings it will be perceived that there extends from the cylinders toward the crank-shaft and on each side of the piston rod or rods an oblong cast-iron box, *a a*, which is either bolted fast to or made in one piece with the cylinder or cylinder-cover, and these boxes constitute the condenser, and, if necessary, the hot-well, and contain the air, pump or pumps, and, if desired, the feed-pumps and circulating and fresh-water pumps, in case surface-condensers are used. These boxes also support the slides for the cross head, and, in fact, constitute part of the framing or bed-plate of the engine.

In the drawings I have shown the engine with two piston-rods, *c d*, and the cross-head as vertical, but any number of piston-rods and a horizontal or inclined cross-head may be used, provided the construction is such that the shaft of an opposite engine may pass without interfering with the rods when engines driving propellers on opposite sides of the stern-post are used. These boxes contain the various pumps *e f g h*, which are vertical, and may be actuated by means of lever-beams (see Figs. 2 and 8) or a rock-shaft receiving motion from the piston-rod, cross-head, or other suitable moving part of the engine by any proper connection. This construction utilizes the framing and saves space, and also constitutes a very convenient arrangement of the pumps, which are by means of partitions or pipes to be caused to receive and deliver from the proper compartments, such as the hot-well, fresh-water reservoir, condenser, &c.

This improvement is useful in any application of a horizontal condensing-engine. The connecting-rod or rods lead from the cross-head to the crank, as usual, and the crank-shaft is supported in pillow-blocks carried by a cast-iron framing, *k*. This framing is to be bolted to the keelsons, and is to be connected with the box bed-plates containing the condensers, &c., by iron rods *l l*, fastened by sockets and keys as usual.

It is well known that all ships weave or change their shape more or less in directions across their floors, and if engines laid athwart ships are firmly secured to the floors by rigid bed-plates they are liable to fracture.

Now, by this improvement—viz., a bed-plate in two pieces connected by wrought-iron rods—I am enabled to secure the cylinder and crank-shaft firmly to the ship and keep them at nearly the same distance from each other by the iron-rods, while at the same time the rods, being flexible, admit of weaving or change of shape of the floor without fracture of the framing as a whole. The engine, as a whole, by reason of the clearances and the fact that the connecting-rod is, as usual, jointed at each end, is capable of working efficiently even if a considerable change of shape occurs in the ship's floor.

This improvement is therefore specially applicable to propeller-engines; but as vessels with two propellers, one on each side of the

stern-post, are now often desirable, and as it is useful if not essential that each propeller should be driven by at least two engines, I have devised an arrangement by which my engine may be most advantageously applied in such vessels. I therefore arrange four such engines, as seen in Figs. 6, 7, and 8, and in order to do so I cut or cast holes through the condensers *x x*, through which the shafts of the opposite engines may pass freely.

This arrangement of engines having framing made up of separate castings united by rods, as described, also presents facilities for the construction of a diagonal or other framing lengthwise of the ship, whose struts and braces pass between the rods uniting the pillow-block castings with those containing the condensers, and inspection of the drawings will show that the arrangement is compact, accessible, and well adapted for the purpose. Two of these engines only may be used, one on each propeller, but I prefer four.

I claim as of my own invention—

1. A horizontal engine provided with a box-framing near and attached to the cylinder and containing vertical pumps, substantially as described, said framing also constituting the condenser or the channel-ways thereof.

2. A horizontal engine having a box-framing containing pumps and an independent pillow-block framing, when the latter is combined with the former by wrought-iron rods, substantially as described, and for the purpose specified.

3. Arranging engines having the characteristics set forth in the second claim on opposite sides of a vessel, when such engines have openings through the framing for the passage of a propeller shaft or shafts, substantially as hereinbefore described.

In testimony whereof I have hereunto subscribed my name.

JOHN BAIRD.

In presence of—

WM. A. LOCKWOOD,
JAMES A. BAIRD.