

W.B. Reaney
Improvements in Marine Engines.

PATENTED DEC 6 1870

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Fig. 1.

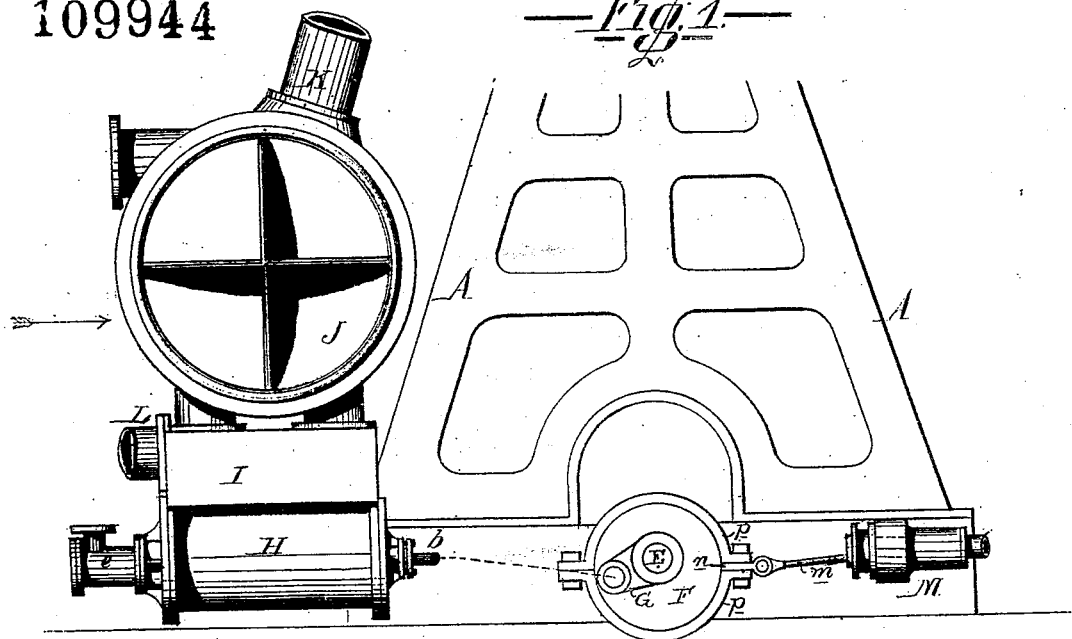


Fig. 2.

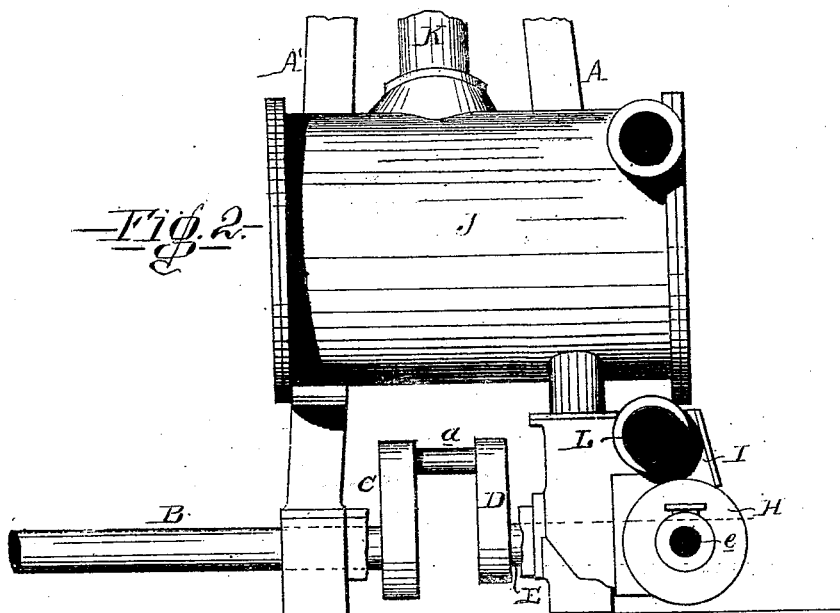
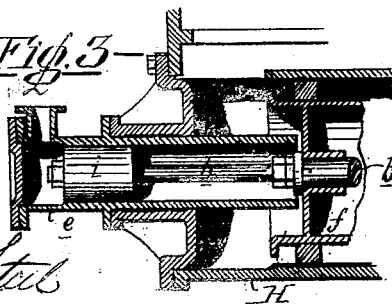


Fig. 3.



Witnesses {

Wm. Astor
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W.B. Reaney
By his Atty
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United States Patent Office.

W. B. REANEY, OF CHESTER, PENNSYLVANIA.

Letters Patent No. 109,944, dated December 6, 1870.

IMPROVEMENT IN MARINE ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern.

Be it known that I, W. B. REANEY, of Chester, county of Delaware, State of Pennsylvania, have invented certain Improvements in Marine Engines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in marine condensing steam-engines, and my improvements, which are fully described hereafter, consist, more especially, of such a disposition of the air-pump and condenser as results in the economizing of space and in general simplicity of construction.

In order to enable others skilled in machinery of this class to make and apply my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing which forms a part of this specification, and in which—

Figure 1 is a front view of sufficient of a marine engine to illustrate my improvements;

Figure 2, a side view looking in the direction of the arrow, fig. 1; and

Figure 3, a section of the feed-pump and part of the air-pump.

Similar letters refer to similar parts throughout the several views.

A and A represent the frames or standards of the engine, to the top of which are secured the cylinder, valves, and other appliances which it has not been deemed necessary to illustrate and describe, inasmuch as they may be of the usual construction.

B is the propeller-shaft, turning in suitable bearings and extending through the stern of the vessel, where it is furnished with the usual propeller, the inner end of the shaft having the crank *a*, which is embraced by the lower end of the usual connecting-rod, and this pin projects into a second crank, D, on a short supplementary shaft, E, which carries the usual number of eccentrics, namely, two for operating the link of the main valve, and one for operating the cut-off valve.

One only of these eccentrics, marked F, is shown in the drawing, fig. 1.

On the outer end of the supplementary shaft E is a crank, G, the pin of which is connected by a suitable rod to the guided cross-head of the bucket-rod *b* of the air-pump H, which occupies the horizontal position shown, and which may be secured to the frame-work of the engine in any appropriate manner.

At the rear of the air-pump is the feed-pump, which will be more especially alluded to hereafter, and above the air-pump is the valve-chest I, and above the latter the condenser J.

My invention has no relation to the valves, passages, &c., within the chest I, or to the interior arrangement of the condenser, for these parts may be

similar to those of other engines, and are well understood by those versed in marine engineering, hence they have not been deemed worthy either of illustration or description.

For the same reason the usual valves connected to the bilge-pump, feed-pump, and discharge-pipe have been omitted.

It will suffice to remark, as regards the operation of the above-mentioned parts, that the exhaust steam passes directly through the pipe K to the condenser L, and that the condensed water is forced by the air-pump through the pipe L into the sea.

Since the introduction of marine engineering, attention has been especially directed to the disposal of the air-pump and condenser, the main obstacles to contend against by designers of marine condensing-engines being the space occupied by these necessary adjuncts, and the imparting of the necessary motion to the air-pump bucket without complex and costly mechanism. In carrying out my invention I have held especially in view the economizing both of space and mechanism, and, as a starting point, I have adopted a style of engine such as is commonly used on high-pressure propeller-boats, that is, a vertical engine with cylinder, valves, &c., supported on a frame-work, and directly above and in line with the propeller-shaft; engines of this class being well known for their economy as regards construction.

In applying an air-pump to this engine I have arranged the said pump horizontally, or, if desired, it may be slightly inclined.

The supplementary shaft E, while carrying the necessary eccentrics, serves, through the simple devices of a crank, connecting-rod, and guided cross-head, to impart the desired reciprocating motion to the air-pump bucket.

Independently of this economical mechanism, the air-pump itself is so situated that the space which it occupies is immaterial.

In respect to the condenser J, it will be seen, on reference to fig. 2, that it is of such a length as to be within the limits of the engine as regards the breadth of the latter.

On reference to fig. 3 it will be observed that the feed-pump barrel *c* projects so far into the air-pump as not to interfere with the bucket of the same, while the rod *h* of the feed-pump bucket *i* is a continuation of and has the same stroke as the rod *b* of the air-pump bucket. By this arrangement a feed-pump, projecting into space available for the storage of coal, &c., is avoided, while no other mechanism is required for operating the bucket of the feed-pump than a simple continuation of the rod of the air-pump.

Another and perhaps minor improvement relates to the driving of the bilge-pump M, for which pur-

pose I have availed myself of one of the eccentrics on the supplementary shaft E.

A plate, *n*, is secured between the eccentric straps *p*, where the latter are bolted together, and to the plate is joined a rod, *m*, the latter passing into the hollow plunger, to which it is jointed, in a manner well known to engineers, to whom will be apparent the economy of the arrangement both as regards construction and space.

If we view the entire structure as regards its relation to the vessel, it will be seen that the air-pump and condensers and appliances connected therewith occupy a position on one side of the engine between the latter and side of the vessel, while the space between the other side of the engine is free for a passage, and coal-bunkers, &c.

I have shown the condenser as being cylindrical in form, and I prefer this shape on the score of economy,

but it may be of any other shape which circumstances and the judgment of the engineer may suggest.

I claim as my invention and desire to secure by Letters Patent—

1. The arrangement of the air-pump and the supplementary shaft E, its eccentrics F, and crank G, as set forth.

2. A feed-pump, having its barrel arranged partly within the air-pump and its bucket-rod connected to the air-pump bucket-rod, all substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

W. B. REANEY.

Witnesses:

SAMUEL ULRICH,

W. B. BROOMALL.