W. Wright,

Portable Steam Engine.

No. 49,334. Patented Aug. 8, 1865.

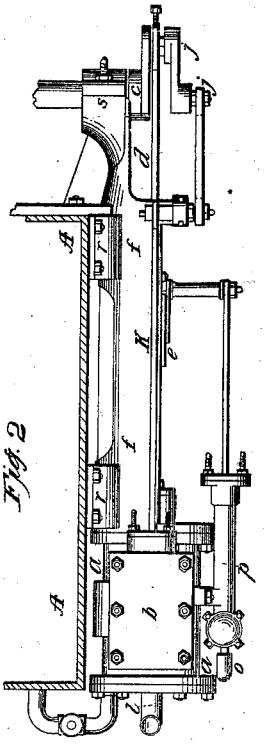

Fig. 2

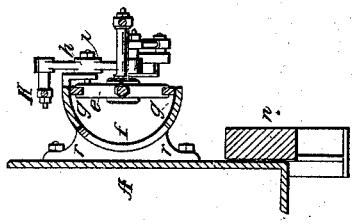

Fig. 3

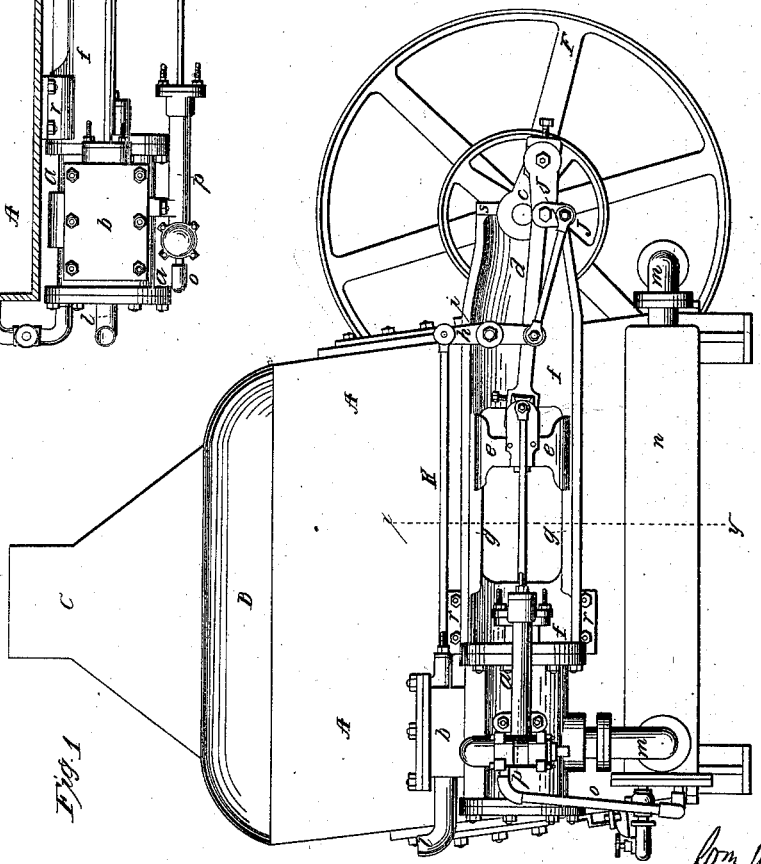

Fig. 1

Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, OF NEW YORK, N. Y.

IMPROVEMENT IN PORTABLE STEAM-ENGINES.

Specification forming part of Letters Patent No. **49,334**, dated August 8, 1865.

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT, of New York, in the county and State of New York, have invented certain new and useful Improvements in Steam Machinery; and I hereby declare that the following, taken in connection with the accompanying drawings, is such a full, clear, and exact description of the same as will enable others skilled in the art to make and use the same.

This invention relates to the construction of portable steam-engines or other steam-engines in which the boiler forms the frame or support to the steam-cylinder crank-shaft and all other appurtenances of the steam-engine which receive or impart the propelling-power, and which constitute the prime mover.

In such steam-engines, as heretofore constructed, there was necessarily much strain upon the various parts of the boiler, due in part to the direct action of steam on the piston in the cylinder, which forms one fixture to the boiler, and to its indirect action on the support of the crank-shaft, which forms another fixture to the boiler, the tendency of which is to alternately distend and contract the intermediate portions of the boiler, and, in part, to the jars and vibrations attending the operation of the machine, the effect of which is increased with the number of independent points of attachment of the engine or its parts to the boiler. For these reasons portable steam-engines are of comparatively little durability and require frequent repairs. The object of this invention is to remedy this important defect, and I have accomplished the same by a new mode of combining the engine with the boiler—*i*, *e.*, by a mode of attaching the former to the latter.

In the accompanying drawings, Figure 1 is a side elevation of a portable engine and boiler complete. Fig. 2 is a plan view of the engine, exhibiting the manner of attachment of the engine to the boiler, shown in section; and Fig. 3 is a vertical transverse section on line *x y* in Fig. 1.

For the purposes of this specification no particular reference is needed to the boiler. It will suffice to say that it may be of the general form shown in the drawings, or of any other known or suitable form or arrangement and construction. In this instance the boiler is supposed to belong to the tubular class, being of a parallelopiped form, surmounted by a dome, B, from which springs the chimney C.

The engine is mounted against and attached to one of the vertical sides of the boiler, to counterbalance which the fly-wheel F is established on the opposite side. There is no particular novelty in the construction, arrangement, or operation of the engine proper. Like most portable engines, it consists of a steam-cylinder, *a*, containing a piston whose reciprocating travel within the cylinder is governed by the valves in the steam-chest *b*. The movement of the piston is transmitted to the main crank *c* by means of a connecting-rod, *d*, jointed to the cross-head *e*, to which the piston is attached, and which is guided in ways or guides *g*, fast to the frame *f*. A rocking beam, *h*, having its fulcrum at *i*, and receiving its motion from the main crank *c* through the intermediary of the double auxiliary crank *j*, fast on the pin of the said main-crank, actuates the valve-rod. Steam is admitted into the chest through the pipe *l*, and is exhausted through the pipe *m* and traversing vessel *n*, through which the feed or water-supply pipe *o* passes, so as to utilize the waste heat of steam for the purpose of heating the water previous to being injected into the boiler. The force-pump *p* is operated from the cross-head *e*, to which its plunger or piston rod is attached.

Those portions of the engine just described and referred to are in no respect novel or original, and consequently form no part of my present invention, my reason for inserting them being to further the complete elucidation of my actual improvement, to which I shall now more particularly refer.

With the head of the cylinder *a* is cast, in one piece, the bed-plate or frame *f*, which is a shell of semi-cylindrical form, so as to partially inclose the moving parts of the engine. At each end the frame is provided with brackets *r*, whereby it is securely bolted to the boiler. The outer end of the frame, or the end opposite to that which forms the cylinder-head, is formed into a bracket, *s*, projecting from the rear end of the boiler, and carrying the boxes or pillow-blocks or bearings of the main driving-shaft, and is properly recessed to allow free play to the crank *c*. The inner and overhanging edges of the semi-cylindrical frame situated in the vertical plane passing through the

axis of the steam-cylinder are provided with guides or ways *g*, upon which the cross-head whereby the coupling of the steam-piston rod with the movable parts of the steam-engine is effected have their reciprocating travel. The cylinder head and frame is attached to the steam-cylinder, or, vice versa, the cylinder is attached to the frame, by means of bolts passing through the flange.

From the foregoing description it will be understood that the whole engine may be fitted and truly adjusted without reference to the boiler, and that the whole engine, when fitted to the frame of which it is an integral part, can with ease and at a comparatively little cost be secured or fitted to the boiler.

As to the working of this improvement, it will be seen that inasmuch as the cylinder is, as it were, suspended — *i. e.*, having no rigid connection with the boiler—the strain attending the operation of the other reciprocating engines is entirely done away with.

Having thus fully described my invention and the manner in which the same is or may be carried into effect, I claim—

The arrangement of portable steam-engines with reference to the manner herein described of attaching the engine proper to the boiler.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

WM. WRIGHT.

Witnesses:

A. POLLOK,

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