# G. ROGERS.

## Improvement in Portable Steam-Engines and Boilers.

No. 129,058. Patented July 16, 1872.

Fig. 1.

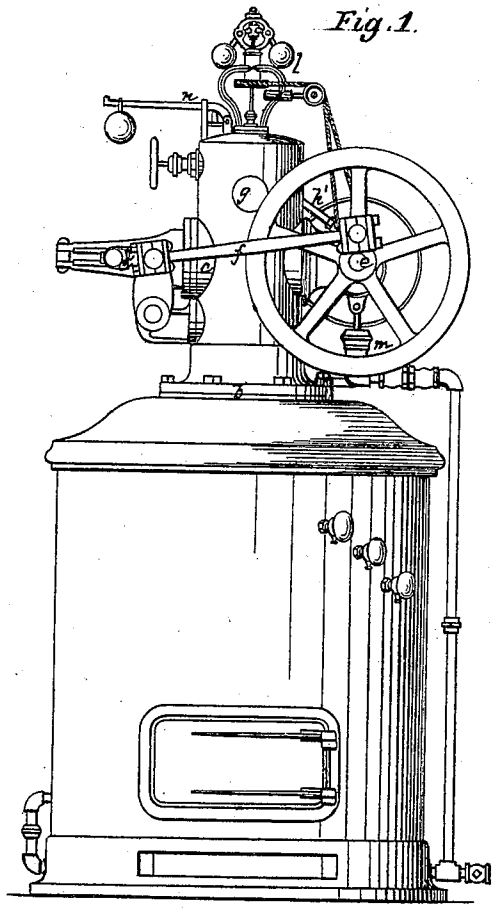


Fig. 2.

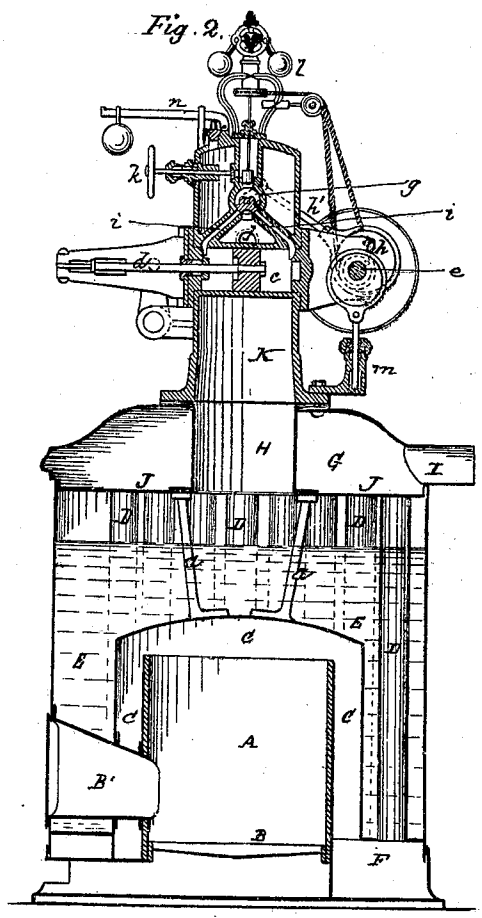


Fig.

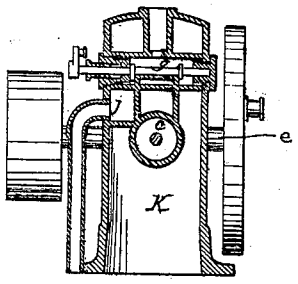
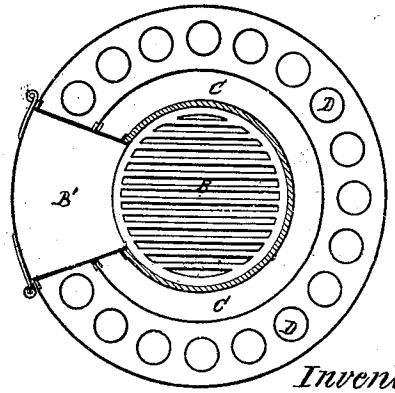


Fig.



Witnesses
W. S. Henderson
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Inventor
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# UNITED STATES PATENT OFFICE.

GEORGE ROGERS, OF MOUNT VERNON, OHIO.

## IMPROVEMENT INPORTABLE STEAM-ENGINES AND BOILERS.

Specification forming part of Letters Patent No. 129,058, dated July 16, 1872.

*To whom it may concern:*

Be it known that I, GEORGE ROGERS, of Mount Vernon, Knox county, Ohio, have invented certain new and useful Improvements in Steam-Engines and Boilers, of which the following is a specification:

My invention consists in certain improvements in the construction and the arrangement of the parts of steam-engines and boilers, particularly of portable engines and boilers, so called, with a view to obtaining a compact, good, and comparatively inexpensive apparatus. The boiler is provided with down-and-up flues and passages, both surrounded by the water, through which the products of combustion, issuing from the fire-chamber, first pass down through and under the water-space, and then up through said water-space into a smoke-box between the flue or tube sheet and the top of the boiler, whence they escape into the chimney-flue. The steam-dome is arranged above the flue or tube sheet in such manner as to project above the top of the boiler. The lower portion of the dome is surrounded by the smoke-box, thus constituting a superheater. On the upper portion of the dome is built the engine, all the parts of which may be carried by the dome. The steam-cylinder is placed horizontally across the dome with its heads arranged on the exterior of or projecting beyond the sides of the same, so that while the body of the cylinder is inclosed within the dome, and surrounded by steam, access can be had to its interior at any time without trouble. I prefer to make the dome in two portions, the lower within the smoke-box, and the upper or dome proper on the top of the boiler; the two parts being bolted together in a suitable manner, this being of advantage on several accounts, as it allows the removal of the engine-carrying portion without necessitating the moving of the part within the smoke-box; the engine may be fitted to the upper portion before the latter is placed in position; and the said portion, with the engine which it carries, may, if desired, be placed upon any suitable bed or support, at a distance from the boiler, and without necessarily being directly connected with the portion of the steam-dome within the boiler.

Having described in a general way these improvements, I will proceed to describe more particularly the manner in which my invention is or may be carried into effect, by reference to the accompanying drawing, in which—

Figure 1 is an elevation of a boiler and engine made in accordance with my invention. Fig. 2 is a vertical central section of the same. Fig. 3 is a vertical section of the dome and engine in a plane at right angles to the plane of section in Fig. 2. Fig. 4 is a horizontal section of the boiler.

The boiler is so constructed as to combine the greatest possible strength with lightness, and to secure a large amount of heating-surface in a small space. A is the fire-box, provided with grate B and door B′ and a combustion-chamber and passage or flue C on its top and sides. Said chamber and passage are surrounded by the water-space E. From the combustion-chamber the flames pass downward through the annular flue or passage C into the gas-chamber F, and thence upward through flues or tubes D into the upper smoke-box G. This smoke-box envelops a part, H, of the steam-dome, and connects, by the flue I, with the smoke-stack. The part H is supported on the tube-sheet J, through which an aperture is formed to admit steam from the steam-space into the dome. Stays *a* are used to brace the tube-sheet to the crown-sheet of the combustion-chamber C. The part H, arranged as described, serves as a superheater. It is preferably of cylindrical form, and constitutes the lower portion of the steam-dome, of which the upper or main portion, or the dome proper, as it may be considered, extends above the top of the boiler, as seen at K. As before stated, and for the reasons before given, I prefer to make the parts H and K separate, and then, when the part K is to be set on the boiler, I unite it with the lower section H by bolting together their flanged contiguous ends, as shown at *b*, Fig. 1, or by bolting the top part K to the top of the boiler, to which the lower part H in such case will have been previously connected. In the part K the engine is arranged. The steam-cylinder is shown at *c* arranged horizontally across the dome, with its ends opening out therefrom and closed by suitable heads. At one end of the cylinder are the piston-rod *d* and slide *c′*; at the other end the driving-shaft *e*, supported in suitable brackets projecting from the head of the cylinder

and connected with the piston-rod and slide by connecting-rod *f*. The steam-chest is shown at *g*, also within the dome, placed in this instance horizontally but at right angles with the cylinder, and provided with a rotary valve, actuated from shaft *e* by eccentric *h* and rod *h'*. The induction-ports are shown at *i* and the exhaust at *j*. The throttle-valve is represented at *k;* the governor at *l*, with its valve inside the steam-dome; the pump at *m;* and the safety-valve at *n*.

It is not necessary that I should specify the construction of these parts as this will be readily understood by steam-engine manufacturers; and I do not confine myself, of course, to any specific construction of any of these parts, as my invention has relation only to the arrangement of the engine upon the dome without regard to the particular construction of the engine.

By the arrangement of the dome as above described—that is to say, by projecting it above the boiler—it is adapted to carry the engine, and an exceedingly compact boiler and engine are secured.

By making the dome in two parts, the upper portion or dome proper K, which contains the engine complete, may be bolted to any kind of bed, and need not necessarily be directly connected with or make part of the boiler. It may, for instance, with an engine of small size—say one of two-horse power—be fixed to a stand in a show-window and steam taken from a boiler located in another part of the building.

The engine and boiler thus made also present a very neat appearance, and can be built economically and expeditiously.

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

1. The arrangement of the engine on the steam-dome of the boiler, substantially as herein shown and described.

2. In combination with the upright steam-dome, the steam-cylinder, arranged horizontally within and with its head opening out from the sides of said dome, substantially as shown and described.

3. The steam-dome composed of two parts, the one within the upper part of the boiler or the smoke-chamber therein, the other extending above said boiler and connected or communicating with said lower part, as herein shown and set forth.

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

GEO. ROGERS.

Witnesses:
WM. MCCLELLAND,
W. C. CULBERTSON.