R. H. Davies,

Steam-Engine Attachment,

No. 47,766, Patented May 16, 1865.

Fig: 1.

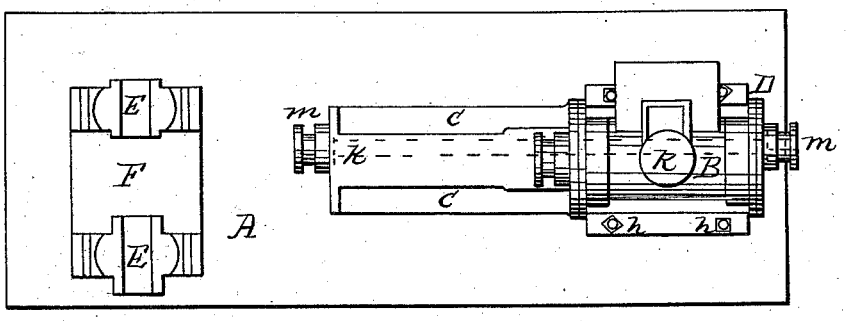
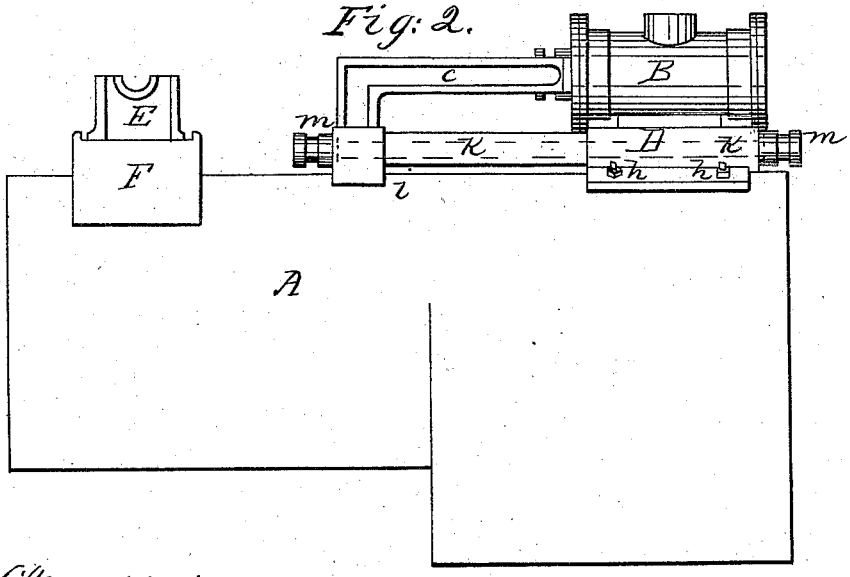


Fig: 2.



Witnesses.

Edward Brown.

Geo. Sidebotham

Inventor.

Robert H. Davies

UNITED STATES PATENT OFFICE.

ROBERT H. DAVIES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, JAMES W. LANDELL, AND THOS. J. YOUNG, OF SAME PLACE.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **47,766**, dated May 16, 1865.

To all whom it may concern:

Be it known that I, ROBERT H. DAVIES, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that class of steam-engines, commonly called "portable," in which the engine and boiler are attached together, the boiler serving as a foundation for the engine.

It consists in arranging a feed-water heater between the cylinder and boiler in such a manner as to prevent the expansion of the boiler putting a strain upon the engine.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Figure 1 is a plan. Fig. 2 is an elevation. Similar letters on each figure refer to the same parts.

A is the steam-boiler; D, the heater. This heater is hollow and of cast-iron, and it has a stuffing-box at each end at *m m*. These boxes are connected by a wrought-iron pipe (shown in dotted lines *k k*) running through from end to end of the heater. One end of this heater is firmly fixed to the boiler by the bolts or screws *h h*. The other end at *i* rests upon the boiler, but is not fastened to it, thus permitting a free expansion of the boiler.

B is the cylinder; C, the slide-bars bolted to the cylinder at one end and to the heater D at the other; E, the pedestals for carrying the crank-shaft.

F is a saddle bolted to the boiler, and supporting the pedestals E.

The cylinder B is bolted firmly to the heater D, and the exhaust-steam, escaping from the cylinder to the atmosphere, passes into the heater D, surrounding the pipe *k k*, through which the cold water passes on its way to the boiler.

I do not claim combining a heater and bed-plate together and placing it between the cylinder and boiler when the cylinder and pedestals are both fixed to the same casting; but

I claim as my invention—

1. The heater D, used as a bed-plate, but detached from the supports of the pedestals E, and fixed to the boiler in such a manner as to prevent the expansion of the boiler from putting a strain upon the engine, substantially as shown and described.

2. The arrangement of the saddle F, cylinder B, slide-bars C, heater D, and boiler A, substantially as described.

ROBERT H. DAVIES.

Witnesses:

EDWARD BROWN,

PARK MCFARLAND, Jr.