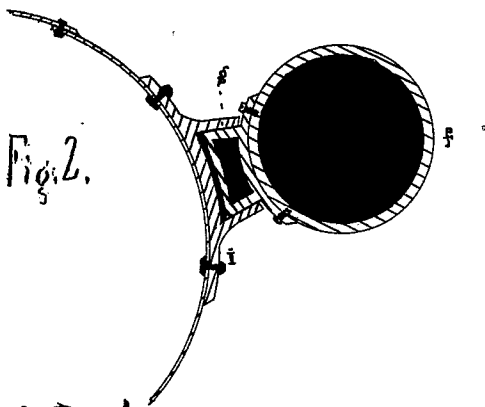
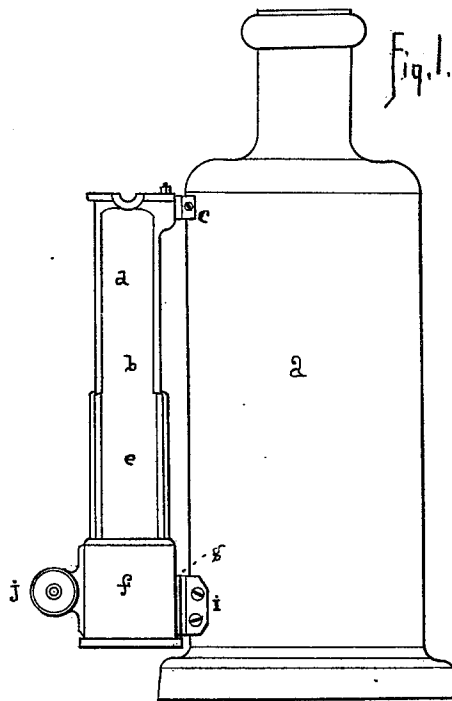


H. M. DURPHY.

EXPANSION JOINTS FOR STEAM-ENGINES.

No. 175,276.

Patented March 28, 1876.



J. F. Parker
Atty. in Law
Witness.

Henry Mortyn Durphy
Inventor.

UNITED STATES PATENT OFFICE

HENERY M. DURPHY, OF ITHACA, NEW YORK, ASSIGNOR TO WILLIAMS BROTHERS, OF SAME PLACE.

IMPROVEMENT IN EXPANSION-JOINTS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **175,276**, dated March 28, 1876; application filed December 9, 1875.

To all whom it may concern:

Be it known that I, HENERY MARTYN DURPHY, of Ithaca, Tompkins county, New York, have invented certain Improvements in Steam-Engines, which I have described in the following specification, reference being had to the accompanying drawings, and to the letters of reference thereon.

My invention relates to the adjustment for expansion between the boiler and the bed-plate of the engine, and the nature of my invention will be apparent as I describe it.

Figure 1 is a side elevation of a perpendicular boiler, such as is used in portable engines, with my improvements attached to it. Fig. 2 is a transverse view of my expansion-adjustment.

In Fig. 1, *a* is the boiler, and *b* is the bed-plate of the engine, which is cast in one piece, and is composed of the following parts, viz.: The lug or lugs *c* at its top, and by which the top is bolted fast to the boiler, and of the pitman part *d*, which has at its base the cross-head guide-plate part *e*, and the steam-cylinder *f*. To the cylinder *f* is cast or made fast the dovetail *g*, which dovetail fits into a socket which is cast as part of the lower lug *i*, which lug *i* is bolted fast to the boiler.

Thus any diversity in the expansion of the boiler and bed-plate is provided for by the slip of the dovetail in its socket, and the bending of either the bed-plate or the boiler-plates, the strain on the bolts, as well as the throwing out of line of the engine or its shaft, is prevented.

The object of my joint for expansion is that the expansion of the boiler may be provided for. The main bed-plate of the engine is of cast-iron. The boiler is of wrought-iron usually, and, even if they were heated alike, the expansion of each would not be exactly alike, but the bed-plate is much cooler than the boiler; hence, the boiler or the bed-plate must give or bend if there is no means provided

for the expansion, or the fastenings of the bed-plate to the boiler must give or be broken.

In a portable engine it is desirable that the parts be as few and as well compacted together as possible; hence the boiler must sustain the engine. The same is true of small compact stationary engines. The more compact the parts the better; hence the same relations of bed-plate and boiler are desirable in a device where the engine and boiler are made in one structure, and as it is convenient for the shaft to be adjusted across the top of the boiler it becomes necessary that the provision for the expansion be not made at the top of the bed-plate of the engine. Hence I rivet the top fast to the boiler, or make it fast by lugs there. This throws the place for the expansion at the foot of the bed-plate, where the cylinder is situated; hence the part of the dovetailed joint is cast fast to the cylinder usually, and the socket for the joint is made fast to the boiler; and experience has shown this is a useful and successful position for it, and that it prevents injury to the engine and to the boiler; that an expansion and a retraction takes place, as has been described; that thus the strain on the bolts, bending of the parts, and the throwing out of line of the engine are prevented.

The further uses and advantages of my invention are apparent to those skilled in the art to which it appertains.

I claim—

The dovetailed joint made by the part *g*, fast to the cylinder or bed-plate of the engine, in combination with the socket in the lug *i*, fast to the boiler, for making the device adjustable, by expansion, between the boiler and bed-plate of the engine, as set forth.

HENERY M. DURPHY.

Witnesses:

S. J. PARKER,
WM. G. KING.