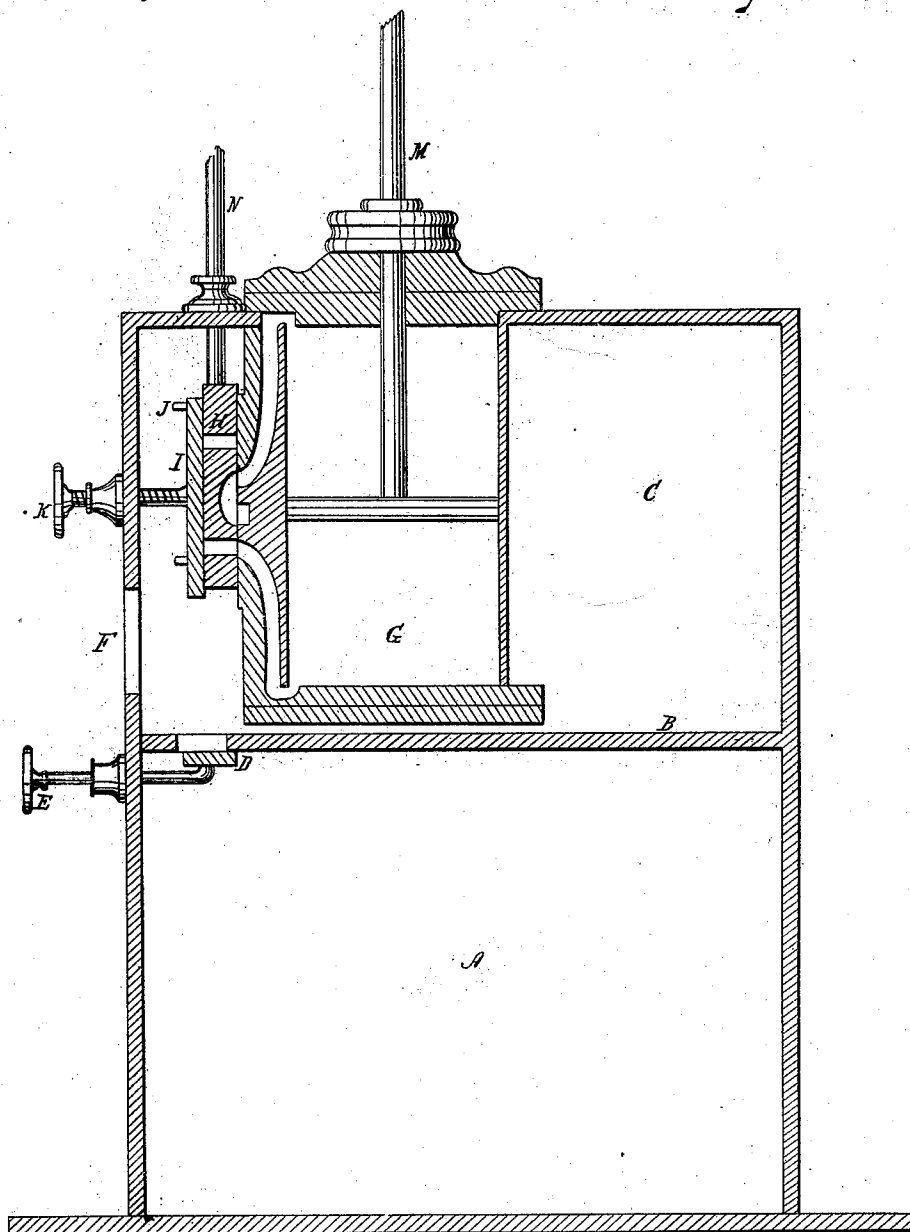


*J. S. Shapter,*  
*Reciprocating Steam Engine,*  
*Nº 15,579, Patented Aug. 19, 1856.*



*Witnesses;*  
*Wm. Haskell*  
*Francis S. Low*

*Inventor;*  
*John S. Shapter*

# UNITED STATES PATENT OFFICE.

JOHN S. SHAPTER, OF NEW YORK, N. Y.

## IMPROVED ARRANGEMENT OF STEAM-CYLINDER WITHIN THE BOILER.

Specification forming part of Letters Patent No. 15,579, dated August 19, 1856.

### *To all whom it may concern:*

Be it known that I, JOHN S. SHAPTER, of the city, county, and State of New York, have invented certain new and useful Improvements in the Construction and Arrangement of the Steam-Engine; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The nature of my invention relates to making a steam-engine compact and portable in arrangement and economical in operation by inserting the cylinder in a separated steam-chamber at the top of the boiler, and also to dispensing with the steam-pipe, steam-chest, and throttle-valve as ordinarily used.

The drawing represents a longitudinal section through the center of the boiler and cylinder and the valve attachments.

A is the top section of the shell of an upright or "vertical" boiler, which boiler may be made after any of the plans in use.

B is a diaphragm-plate separating the top of the steam-space in the boiler into the separated chamber C. The entrance of steam into the chamber may be cut off by the valve D, worked by the handle E, in case the cylinder or any of its attachments require to be got at while the steam is on the boiler.

F is a man-hole opening into the steam-chamber, which is closed and secured by a man-hole plate, as used generally for that purpose, through which the cylinder and valve attachments can be reached.

G is the cylinder, secured to the top of the steam-chamber by its upper flange and made tight with a packing of rubber or other material between them.

H is the valve to the cylinder, made with apertures through which the steam passes to the steam ports and passages of the cylinder, and with a cavity in its under side through which the exhaust-steam passes to the exhaust-port. It is kept in position sidewise on the valve-seat by a raised projection on each side of the seat, forming a recess just to fit its width, and is planed to an even thickness and made flat on its back side.

I is a throttle-plate, operated by the screw K or other mechanical device, by which the amount of steam conveyed to the cylinder through the valve H is controlled by increasing or diminishing the distance between its face and the back of the valve. It is kept in position sidewise by slotted holes in it, in which the pins J J' on the back of the valve work.

L is a piston, and M piston-rod to the cylinder; N, valve-rod by which the valve is operated.

The exhaust-pipe is attached to the outlet of the exhaust-passage and carried through the side or top of the steam-chamber, as may be desired.

The safety-valve to the boiler is placed on it below the diaphragm-plate B, so that it can relieve the boiler of any surplus pressure in case the supply to the steam-chamber is cut off by closing the valve D.

The steam-chamber and the inclosed cylinder and its attachments may be attached to any form of boiler that may be desired; but I prefer an upright tubular boiler on account of its compactness and portability.

The connection of the piston-rod to the attachments necessary to work a crank and the apparatus to work the steam-valve are not shown in the drawing, as they may be varied to suit the application required, or the piston-rod may be attached to the piston of a pump and the steam-valve worked by tappets, as is now done in steam-pumps.

I do not claim inclosing a steam-cylinder in a steam-boiler, as that is known and used; but

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

Inclosing a steam-cylinder in a steam-chamber separated from the body of a steam-boiler, where the supply of steam can be shut off from the chamber by a valve for that purpose, and where the cylinder and its attachments can be got at through a man-hole when the supply of steam to the chamber is so shut off.

JOHN S. SHAPTER.

Witnesses:

M. HASKELL,

FRANCIS S. LOW.