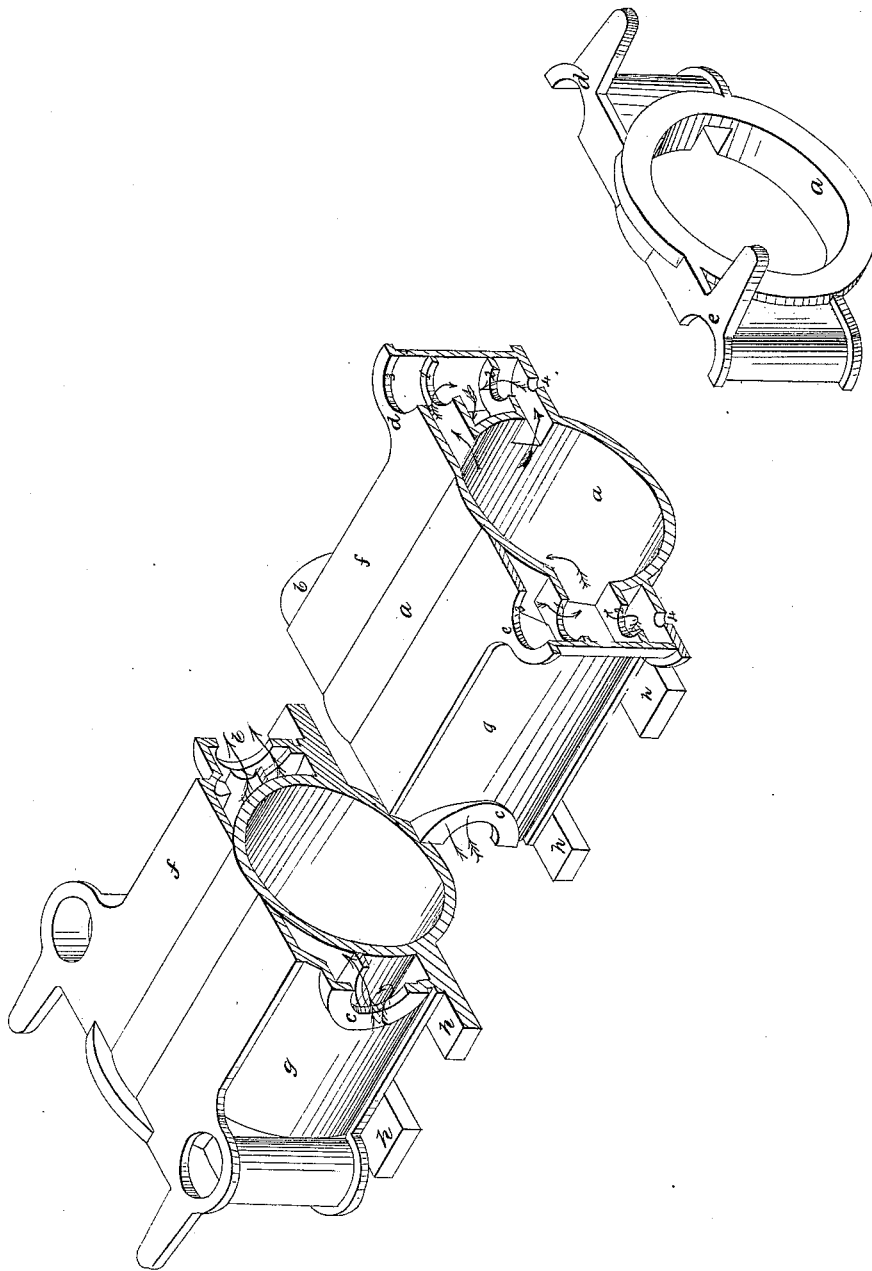


*G. Shield,*

*Steam-Engine Attachment.*

*N<sup>o</sup> 7,634.*

*Patented Sep. 10, 1850.*



# UNITED STATES PATENT OFFICE.

GEO. SHIELD, OF CINCINNATI, OHIO.

## EXHAUST-PASSAGE FOR STEAM-CYLINDERS.

Specification of Letters Patent No. 7,634, dated September 10, 1850.

*To all whom it may concern:*

Be it known that I, GEORGE SHIELD, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Steam-Cylinders; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawing, making part of this specification and representing in perspective a cylinder embodying my invention.

I construct the exhaust passages with a twofold outlet from the cylinder into the valve chamber above and below the disks, and a single outlet between the disks from the valve chamber into the escape pipe, so as to admit to the exhaust opening of a duplex or balance valve, formed in one piece and held to its seat by the stress of steam, and capable of being ground to its seat and inserted or abstracted in the line of its spindle.

My cylinder and its appendages are in the annexed perspective view divided by section athwart the cylinder *a*, at mid length that is through the receiving nozzle *c* and through the exhaust nozzle *b* and again by another section through one set of receiving *e* and another set of exhaust *d* valve chambers. *f g* are the two side steam pipes, *g* being the receiving and *f* the exhaust pipe. 1' is the larger and 2' the smaller valve seat of the receiving balance valve and 1 2 are the corresponding ones of the exhaust. 3 3' are the openings in the top of the valve chambers, through which the valves are inserted or extracted. 4 4' are small apertures for the admission of the valve spindle guide, and to facilitate the boring of the valve chambers. *h h* are the lugs by which the cylinder rests upon and is bolted down to its frame.

The advantages of this arrangement of valve openings are of a very decided character.

The duplication of the exhaust opening by applying the stress of steam outside the disks enables the larger disk to occupy the uppermost position and thereby not only facilitates its easy insertion and extraction in the line of the spindle but also obviates the necessity of having the exhaust balance valve to consist of two parts and makes it no longer necessary to enter the valve pieces through the cylinder, and by its superior facility and cheapness of construction affords inducements to more general adoption of balance valves, and thus a vast amount of labor is saved to the engineer, and all the levers and other appendages of the valves are enabled to be of a much lighter construction.

What I claim herein as new and for which I desire Letters Patent is—

The twofold outlet or steam passage from the cylinder into the exhaust valve chamber which admits the steam above and below and discharges it between the disks of the exhaust balance valve and thus facilitates the insertion, withdrawal and adaptation to the exhaust side in the line of its stem or spindle of a balance valve whose disks are cast in one piece and are held down to their seats by the stress of steam.

In testimony whereof, I have hereunto set my hand before two subscribing witnesses.

GEORGE SHIELD.

Witnesses:

EDWARD H. KNIGHT,  
GEO. H. KNIGHT.