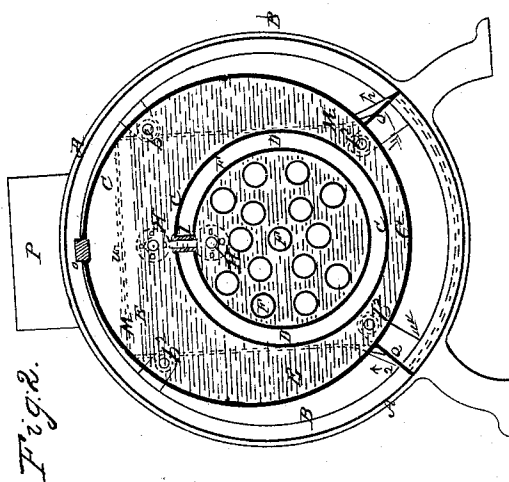
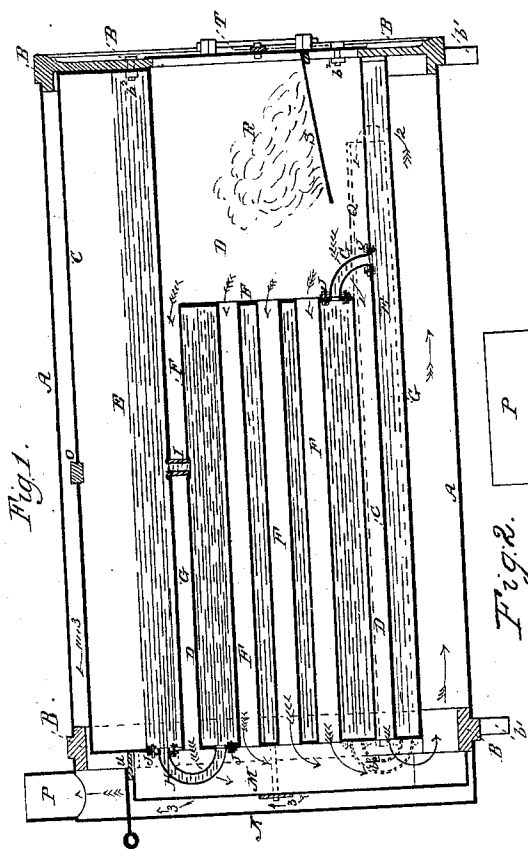


*F. Colligon,*  
*Steam-Boiler Fire-Box.*  
*No 32,682.* *Patented July 2, 1861.*



*Witnesses.*

*W. H. Forbush.*  
*E. B. Forbush.*

*Inventor.*

*Frank Colligon.*

# UNITED STATES PATENT OFFICE.

FRANK COLLIGON, OF BUFFALO, NEW YORK.

## IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 32,682, dated July 2, 1861.

*To all whom it may concern:*

Be it known that I, FRANK COLLIGON, machinist, of the city of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in the Steam-Boiler; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon, in which—

Figure I is a longitudinal section, and Fig. II is a transverse section.

The nature of my invention relates, first, to the arrangement of a removable supplemental flue-boiler within the flue-space of an ordinary steam-boiler, and connecting the two boilers together in such a manner that the flame and heat from the fire shall first pass through and around the inner or supplemental boiler and be then returned under the outer boiler to near its front end, and thence returned over the sides of the outer boiler to the chimney, and so that the water and steam may freely pass from one boiler to the other; second, in so connecting the inner boiler to the outer boiler as that the inner boiler may be conveniently removed for repairs or other purpose without impeding the operation of the other.

Letters of like name and kind refer to like parts in each of the figures.

A represents the outer inclosing case or jacket, of ordinary construction, for a portable steam-boiler which is supported upon the cylindrical frame-pieces B, having legs *b'*.

C represents a cylindrical steam-boiler of common or ordinary construction, with the fire and flue space D made eccentric to the water and steam space E, and so that the larger steam or water space will be above. This boiler is connected to the cylindrical frame-pieces B by means of the lugs and bolts, as shown at *b*<sup>2</sup>.

F represents a supplemental flue-boiler, which is arranged in the large flue-space of the outer boiler and in rear of the fire-space. Its whole diameter is less than the diameter of the flue-space of the outer boiler, and it is so placed and suspended that the flame and heat from the fire must pass through its flues and completely around and over its outer sur-

face in its passage to the outer surface of the outer boiler. It is supported in this position by the pipes G H I. The pipes G and H have suitable flanges by which they are securely bolted to the inner and outer boilers, as shown at J. The pipe G is accessible from the fire-space, and hence may be easily connected or disconnected at any time desired. The pipe H is made accessible by removing the head K of the jacket and the flue-cap M. The pipe I has a screw-thread cut upon its outer surface, with corresponding internal screws through the inner shell of the outer boiler and outer shell of the inner boiler, and it therefore may be screwed in. The jacket being removed it is made accessible by removing the screw-plug O from the outer shell of the boiler. Each of these pipes forms a steam and water connection between the two boilers, and each is easily accessible whenever it is desirable to remove, replace, or clean the inner boiler, as described. The flue-cap M directs the flame and smoke (after they have passed through the flues of and around the inner boiler) downward and into the flue-space under the outer boiler to near its front end, from whence they are directed into the flue-spaces at the sides of the outer boiler, as indicated by the arrows 2, and from thence outside of the flue-cap and between it and the head of the jacket into the chimney, as indicated by the arrows 3. The arrows indicate the course of the flame, smoke, and heat into the chimney P.

Q represents partition-walls, which run lengthwise of the boiler and divide the flue-space between the boiler and the jacket; R, fire chamber or furnace; S, grate; T, door; *u*, damper, which will admit of the direct passage of the flame and smoke from the inner boiler to the chimney when desired.

From this description it will be observed that the supplemental flue-boiler is wholly enveloped in the flame and heat and that the heating and steam-making surface is thereby vastly increased and can be advantageously used without requiring any more fuel than would be required by the one outside boiler, and hence there is great economy and increase of steam-power by the use of the supplemental boiler.

The mode of connecting the two together

is so simple and convenient that it costs but little time and labor to do it, and it is so planned that the supplemental boiler may be removed without interfering with the operation of the other after its removal.

I claim—

1. The arrangement of a supplemental flue-boiler within the large flue-space of an ordinary steam-boiler and connecting the two boilers together in such a manner that the flame and heat from the fire shall first pass through the flues of and around the supplemental boiler, and be then returned under the outer boiler to near its front end and

thence returned over the sides of the outer boiler to the chimney and so that the water and steam may freely pass from one boiler to the other, for the purposes and substantially as described.

2. Connecting the supplemental boiler to the outer boiler by means of the pipes G H I, in the manner and for the purposes substantially as set forth.

FRANK COLLIGON.

Witnesses:

W. H. FORBUSH,  
E. B. FORBUSH.