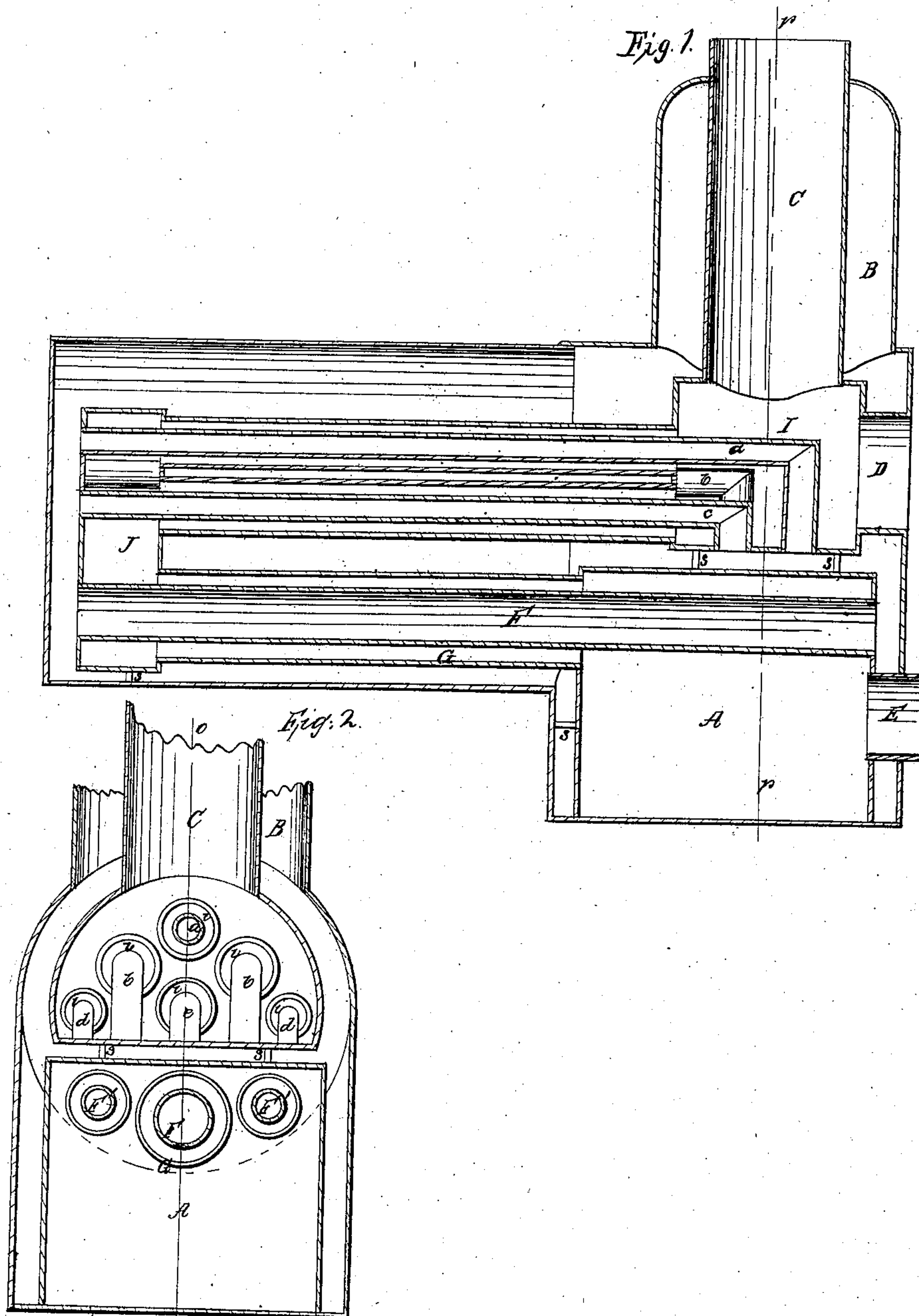


E. B. SINTZENICH.  
STEAM BOILER.

No. 46,533.

Patented Feb. 21, 1865.



Witnesses:  
Wm. G. G. G. G.  
J. B. G. G.

Inventor:  
E. B. Sintzenich

# UNITED STATES PATENT OFFICE.

E. B. SINTZENICH, OF ROCHESTER, NEW YORK, ASSIGNOR TO HIMSELF  
AND JOSEPH HALL, OF SAME PLACE.

## IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 46,533; dated February 21, 1865.

*To all whom it may concern:*

Be it known that I, E. B. SINTZENICH, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in the Construction of Steam-Boilers for Marine and other Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a central section taken in the plane of the red line *o* in Fig. 2. Fig. 2 is a transverse section, as indicated by the red line *p* in Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in the arrangement of water flues or tubes within the horizontal fire-flues of steam-boilers, whereby a far greater amount of fire or heating surface is afforded in a given-sized boiler, and without obstructing the draft, than can possibly be effected as heretofore constructed and arranged; also, in turning the central or water flues of the return fire flues, or those arranged above the fire-box, so as to open through the top or bottom, or right or left hand side, of the chamber, at the base of the smoke-stack, into which a man-hole is provided, through which access is afforded, with a half round scraper, to clean out the annular space between each central water-flue, and its surrounding fire-flue.

To enable others to make and use my invention, I will describe its construction.

Within the fire-flues of any ordinary horizontal steam-boiler I insert a water flue or tube, as seen in the drawings at *a*, *b*, *c*, *d*, and *F* and *F'*. The water-flue *F* and the two side flues, *F'*, are extended through to the front of the fire-box *A* and through the combustion chamber *J*, as shown in Fig. 1, which feature alone greatly increases the fire or heating surface of this class of boilers.

The water-flues of the upper series of fire

return-flues also extend through the chamber *J*. The front ends of these flues should be turned either vertically or horizontally into the water-space, as shown in Fig. 1. This permits a man-hole, *D*, to be opened into the fire-chamber *I* for the purpose of cleaning the annular spaces *i*, Fig. 2, between the water and fire flues, which may be accomplished with a crescent-shaped or half-round scraper.

The space between *F* and *G* or any others that may open into the furnace *A* may be cleaned in the same manner through the doorway *E*.

The size of the flues and their relative proportions may be varied to suit the taste or judgment of different builders or users, and any desired number may be employed.

The smoke-stack *C'*, instead of passing up through the steam-dome, may lead out from the man-hole *D*, in which case a portion or all of the water-flues in the upper series may open upward, if desired, or a portion may be turned each way through the sides and through the top and bottom. This, it is thought, would tend to produce a more thorough and perfect water-circulation. These central water-tubes may be applied to upright boilers and produce the same effect.

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

1. The arrangement of the water-flues centrally within the horizontal fire or combustion flues of marine boilers, as shown, and for the purposes set forth.

2. The combination and relative arrangement of the man-hole *D* with the horizontal return fire or combustion flues and their water-flues, the latter having their front ends connected with the water-space surrounding the combustion-chamber *I*, substantially as shown and described, and for the purpose herein set forth.

E. B. SINTZENICH.

Witnesses:

WM. S. LOUGHBOROUGH,  
R. B. WILLIS.