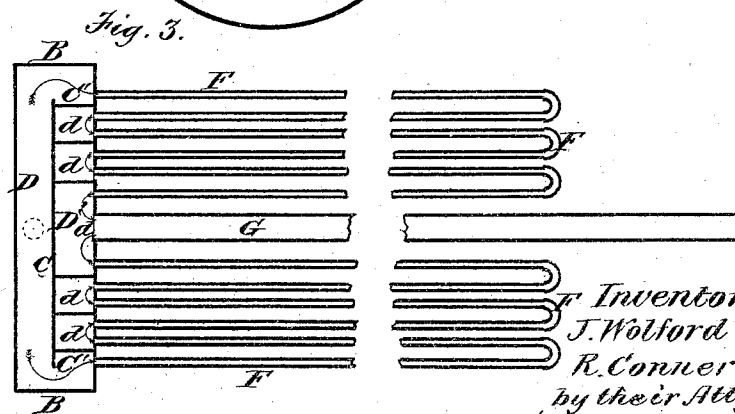
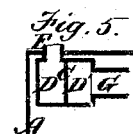
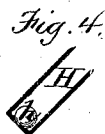
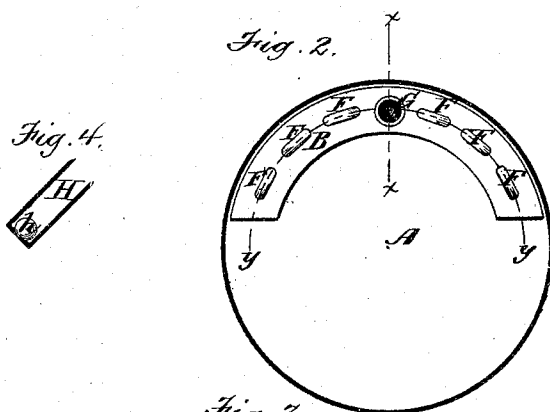
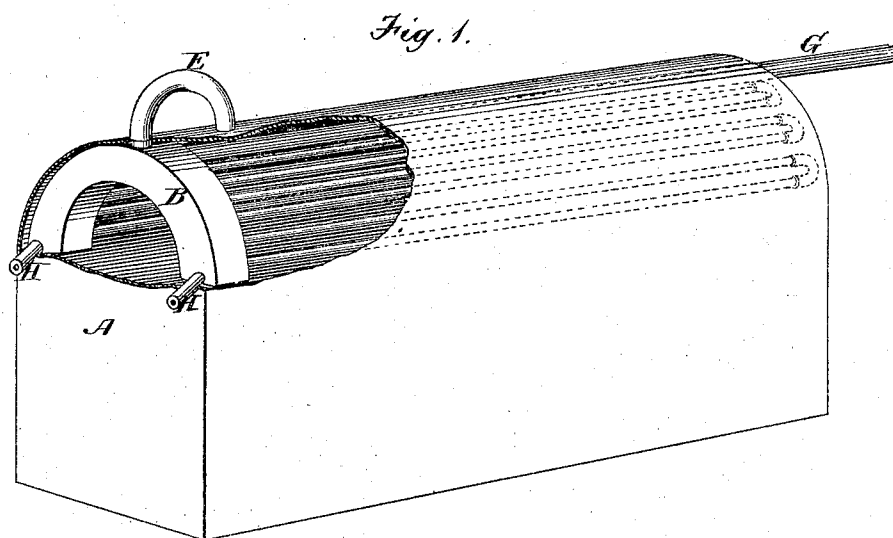


J. WOLFORD & R. CONNER.
Superheaters for Steam-Boilers.

No. 138,723.

Patented May 6, 1873.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN WOLFORD AND ROBERT CONNER, OF KNIGHTSVILLE, INDIANA.

IMPROVEMENT IN SUPERHEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **138,723**, dated May 6, 1873; application filed January 9, 1873.

To all whom it may concern:

Be it known that we, JOHN WOLFORD and ROBERT CONNER, of Knightsville, in the county of Clay and State of Indiana, have invented a new Improvement in Superheaters for Steam-Boilers; and we do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a perspective view with part of the shell removed. Fig. 2 is an end elevation, one end of the shell being removed. Fig. 3 is a curvilinear section in the line *y y*, Fig. 2. Fig. 4 is a longitudinal section of one of the drip-pipes, and Fig. 5 is a transverse section in the line *x x*, Fig. 2.

Similar letters of reference in the accompanying drawing denote the same parts.

This invention has for its object to improve the construction of steam-boilers in such a manner that the steam may be superheated in the boiler. To this end the invention consists in the combination, with a steam-boiler, of the apparatus for effecting the superheating of steam, which I will now proceed to describe.

In the drawing, A is the boiler, which is of ordinary construction. Inside the boiler and next to one end thereof is secured a curved or semi-annular chamber, B, the interior of which is divided into two separate compartments, D D', by means of a longitudinal partition, C C'. A curved pipe, E, conducts steam from the boiler into the compartment D. The compartment D' is divided into a number of smaller compartments, *d*, by transverse partitions, shown in Fig. 3. A series of serpentine pipes, F, opens at one end into the chamber B, and thence extends along the inside of the boiler to the other end of the same, where the pipes are connected in pairs. The two outer pipes F of the serpentine series open into the compartment D, and all the others open into the compartment D', two to each lesser compart-

ment *d*, the two pipes F opening into every said lesser compartment belonging each to a different pair of pipes as regards the connection at the other ends of the latter. From the central compartment *d* a discharge-pipe, G, leads out through the boiler to the point where superheated steam is required for use. Drip-pipes H having ball-valves *h* at their lower orifices incline downward from the lower ends of the chamber B extending outside the boiler. These drip-pipes collect the water that is formed by condensation of steam within the chamber B, and the valves *h* retain the water until thrust backward by the insertion of a wire from the outside.

Operation.

Steam from the boiler passes through the pipe E into the compartment D, and thence into the outer pipes F. From these two outer pipes the steam works through the compartments *d* and intermediate pipes F to the central chamber *d*, whence it is discharged through the pipe G. While circulating through the pipes F and G the steam becomes thoroughly superheated. Each particle of steam it will be observed traverses the whole extent of that half of the series of pipes F which it enters.

What we claim as new is—

1. The semi-annular chamber B having the longitudinal compartments D D' and the transverse compartments *d*, in combination with the serpentine pipes F, inlet-pipe E, discharge-pipe G, and boiler A, all arranged as described.

2. The semi-annular chamber B, in combination with the boiler A, drip-pipes H, and ball-valves *h*, as specified.

3. A boiler for superheating steam having an arched series of serpentine pipes, F, in combination with a series of cells or compartments *d* and chamber B, all as specified.

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Witnesses: ROBERT CONNER.

N. K. ELLSWORTH,
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