

W. AYRES.  
Boiler Furnaces.

No. 200,815.

Patented March 5, 1878.

Fig. 1.

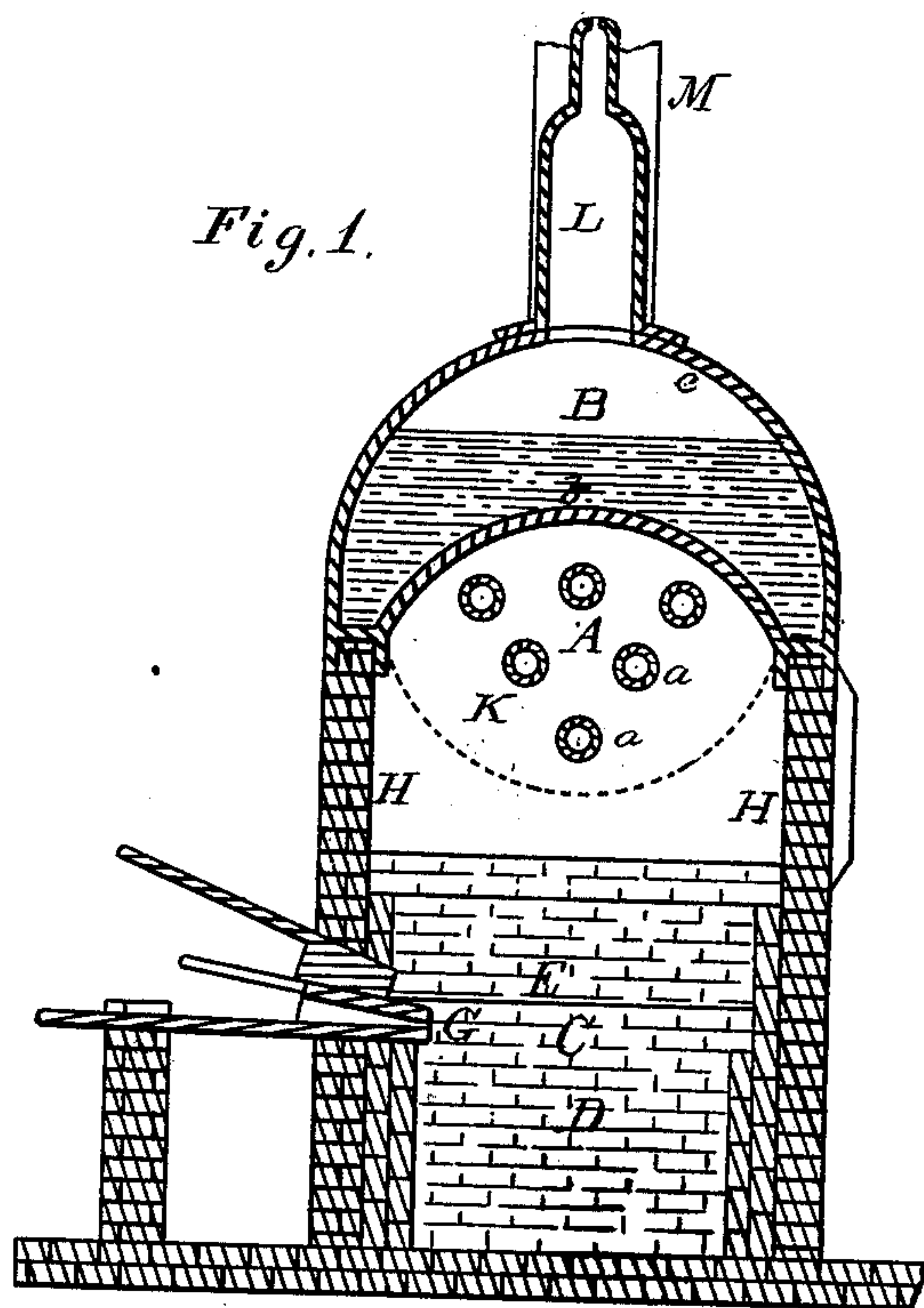
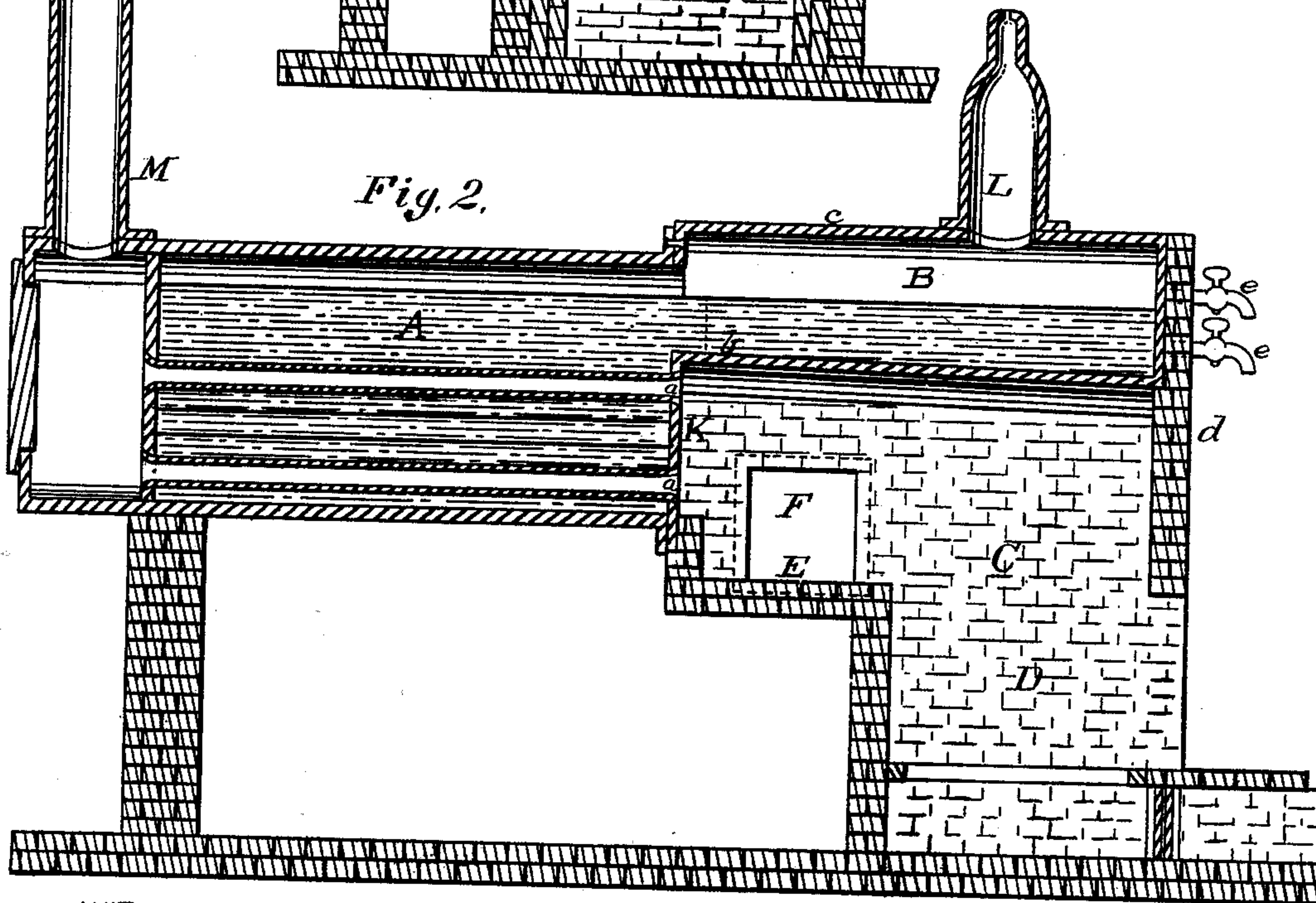


Fig. 2.



WITNESSES

Villette Anderson  
Walter C. Masie

INVENTOR

William Ayres,  
by E. W. Anderson,  
ATTORNEY



# UNITED STATES PATENT OFFICE.

WILLIAM AYRES, OF ST. PETERS, PENNSYLVANIA.

## IMPROVEMENT IN BOILER-FURNACES.

Specification forming part of Letters Patent No. **200,815**, dated March 5, 1878; application filed September 16, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM AYRES, of St. Peters, in the county of Chester and State of Pennsylvania, have invented a new and valuable Improvement in Boiler-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical transverse section of this invention, taken through the hearth. Fig. 2 is a vertical longitudinal section of the same.

This invention has relation to steam-boiler furnaces; and it consists in the construction and novel arrangement of the transversely-curved end extension of the boiler over and forming the crown of the brick-furnace, and supported by the side walls thereof, as hereinafter shown and described.

The object of this invention is to provide a furnace in which the boiler is so placed that the heat of the furnace-fire will be utilized in the generation of the steam required. The heat from charcoal and blast does not extend far from the fire, and in order to obtain the full effect it is necessary to bring the boiler as close to the fire as possible.

In the accompanying drawings, the letter A designates the boiler, which is usually built at about the level of the top of the furnace; and B represents the extension thereof over the furnace, forming its top. C designates the furnace, which may be built in the ordinary manner, of suitable brick, with the front chamber or hearth D, in which the bloom is made, and a raised ledge, E, having a side opening, F, for access into the rear of the furnace. The tuyere through which the blast is introduced into the hearth is indicated at G. The pitch of the hearth-plates and the arrangement of the tuyere vary, as is well known. H H indicate the side walls of the hearth, which are extended up to form supports for the extension B of the boiler. K designates the head of the body of the boiler, and *a* indicates the mouths of the boiler-tubes extending through the same. This plate or head K does not ex-

tend to the top of the boiler, but is connected with the lower plate *b* of the extension, which is preferably made in concave or arched form, springing from the side walls H of the hearth. The upper plate *c* of the boiler-extension is also arched, being convex exteriorly.

As usually constructed, the extension is designed to have a greater span from side to side than the cylindrical portion of the boiler, and the form of its upper plate is preferably semi-cylindrical. Shoulder-plates are employed, when the boiler is constructed in this manner, to connect the end of the cylinder-body with that of the extension.

L indicates the steam-drum, which extends upward from the upper plate of the extension B. M represents the smoke-stack, at the rear of the boiler. Through the front wall *d* of the furnace extend the gage-cocks *e*.

In the construction of the extension B, it is designed to bring its sides down to about the level of the boiler center or axis, and they may be brought lower if thought advisable. By the construction above described, a forge-fire is provided inside the fire-box of the boiler, which, in this case, becomes the hearth.

Such a steam-boiler furnace is thought to be capable of producing sufficient steam to do all the work required in driving its own hammer and blowing machinery.

The boiler-furnace above described is adapted to the smelting and puddling of iron and other purposes.

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

The combination, in a steam-boiler furnace, of the boiler A, having the partial flue-head K, and above this the transversely-concave end extension B, forming the crown of the furnace-chamber, and resting upon the side walls H of the same, the front combustion-chamber C, and the rear chamber F of said furnace, as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM AYRES.

Witnesses:

HENRY AYRES,  
SIMON SHAFFER.