

D. RENSHAW.

Furnaces for Burning Superheated Steam.

No. 149,063.

Patented March 31, 1874.

Fig 1.

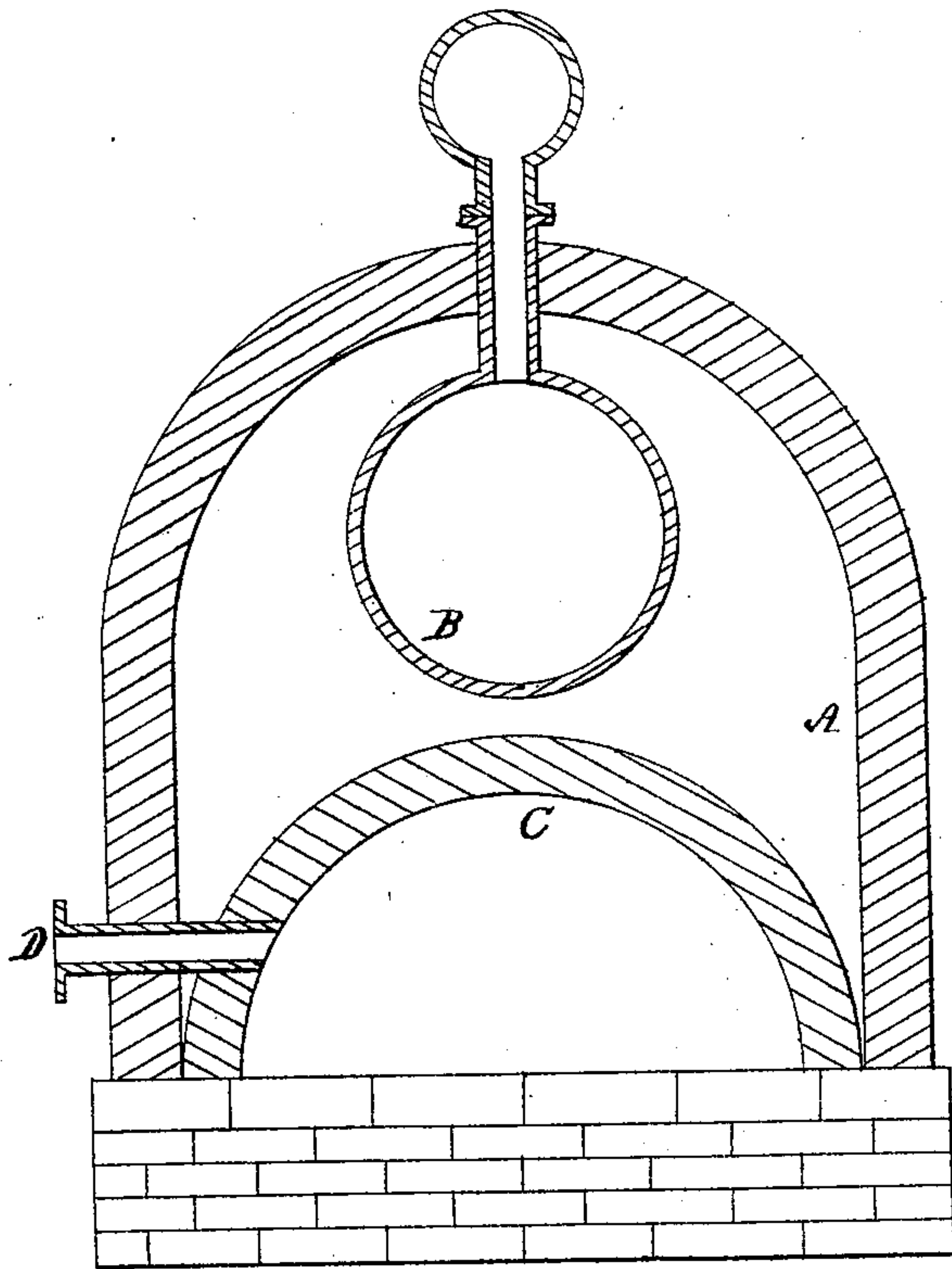


Fig. 2

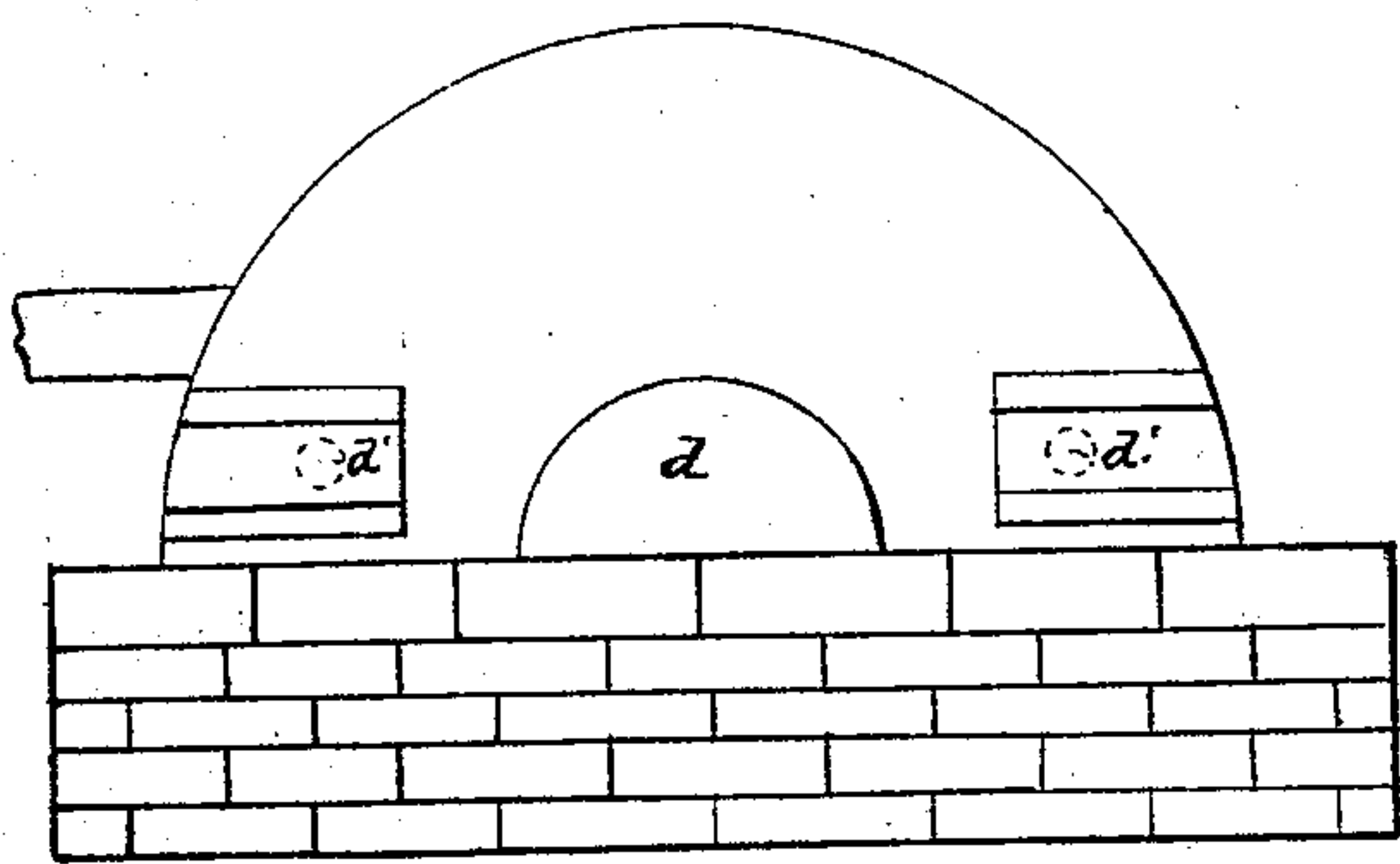
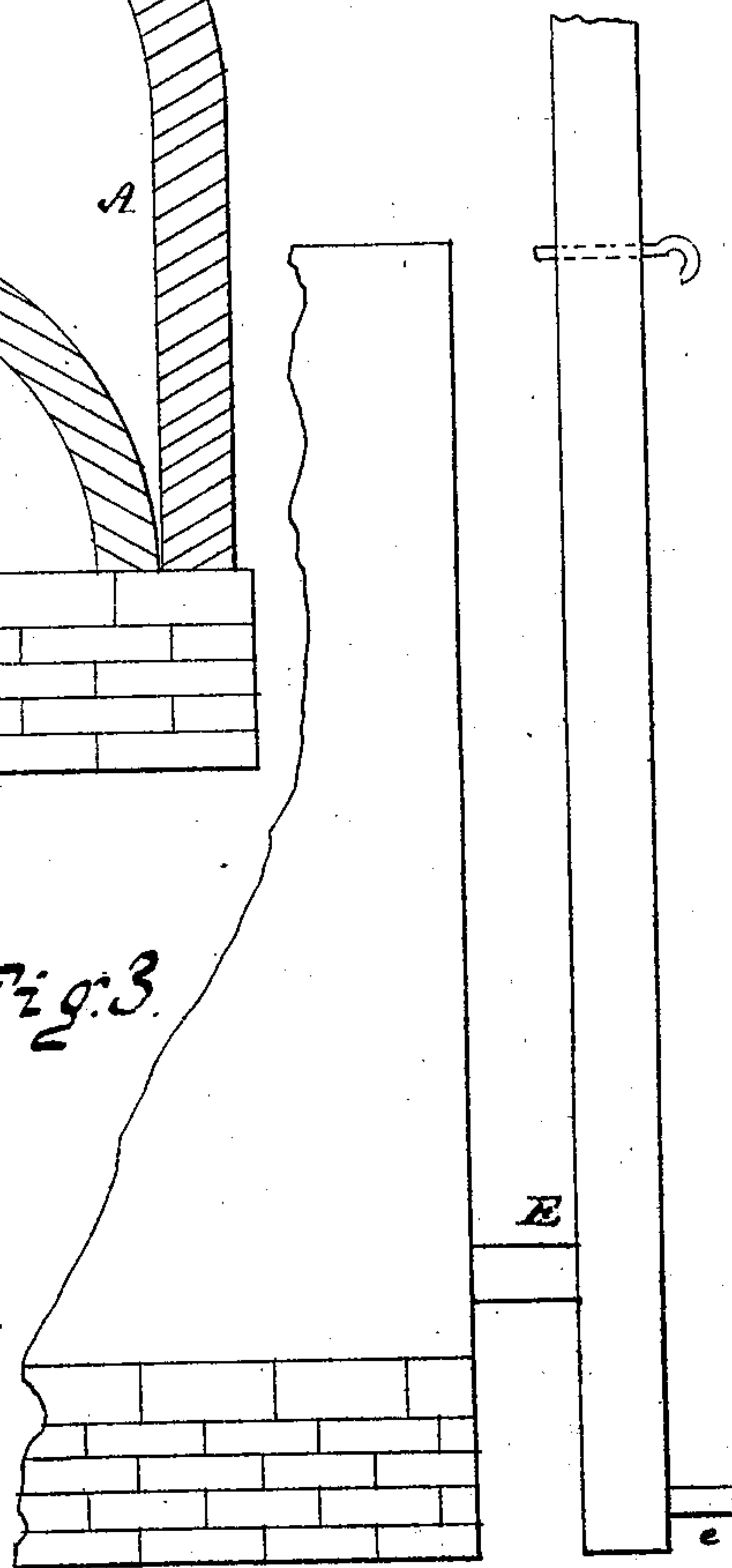


Fig. 3



Witnesses  
J. P. Connolly  
E. Connolly.

Inventor  
David Renshaw  
by  
Connolly Bros.  
Attys.

# UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LYDIE F. RENSHAW, OF HINGHAM, MASSACHUSETTS.

## IMPROVEMENT IN FURNACES FOR BURNING SUPERHEATED STEAM.

Specification forming part of Letters Patent No. **149,063**, dated March 31, 1874; application filed May 13, 1873.

*To all whom it may concern:*

Be it known that I, DAVID RENSHAW of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces for Burning Superheated Steam; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings which form part of this specification.

In the accompanying drawings, Figure 1 is a vertical transverse section of my apparatus for burning superheated steam. Figs. 2 and 3 are detail views.

The object of my invention is to provide a furnace for burning superheated steam and carbons, hydrogen, oil, &c., and other fuels giving off intense heats, having an injurious effect on boilers or other vessels with which their flame is brought in direct contact. The nature of my invention consists in the provision of an arch or diaphragm to be interposed between the flame of the fuel and the boiler or other vessel to be heated, said arch to be made of material having good conducting powers, and at the same time being but slightly or not at all subject to injury from heat or flame, so as to conduct a large portion of the heat and impart it by radiation to the boiler or other vessel from which the fire-chamber is completely isolated.

Referring to the accompanying drawing, A represents a reverberatory furnace, and B a boiler, placed above the arch or diaphragm C, which is made of plumbago fire-brick, crucible clay, or equivalent material, possessing great conducting power, with but slight liability to injury from the flames of the fuels designed to be employed. D shows a pipe for conveying the fuel to the fire-chamber located beneath the arch. *d'* *d'* are air-holes to admit a supply of oxygen to support combustion, and *d* is a door for obtaining access to the fire-chamber. The front of the furnace, as high as the arch, is made of the same materials as is said arch, while the floor is formed

of fire-brick or other material having poor conducting power, so as to retain and give the heat to the upper part of the arch. E is the flue or chimney, starting from the base of the furnace, and provided with a damper at the top and an outlet-pipe, *c*, at the bottom.

The operation is as follows: A fire is first started in the furnace beneath the arch, and kept going until a heat of 700° and upward is obtained. The door of the furnace is then securely closed, and the gas or other fuel admitted through the pipe D, when ignition of such fuel takes place. The heat therefrom is in great measure conducted through and radiated by the arch above, without permitting the contact of the flames with the boiler B.

The chimney E should be formed of fire-brick, and be provided with a damper at the top, while that part of it below the entrance for gases from the furnace may be lined with iron to form a reservoir, so that should the gases be condensed and water formed before escaping from the top of the chimney, such water will fall to the bottom of the flue, and be carried off by the pipe *c* to a suitable receptacle.

By this construction, it will be observed that the fire-chamber is completely isolated from the boiler or other vessel to be heated, with which vessel no part of the flames from said fire-chamber comes in contact, a very large proportion of the heat, however, being conducted through the arch and radiated therefrom.

What I claim as my invention is—

In a furnace for burning gases and similar fuels, an imperforate arch or diaphragm of plumbago clay, interposed between the fire-chamber and boiler or other vessel to be heated, completely isolating the former from the latter, so as to prevent the flames from coming in contact with said boiler or vessel.

In testimony that I claim the foregoing I have hereunto set my hand.

DAVID RENSHAW.

Witnesses:

GEO. C. SHELMEERDINE,  
T. A. CONNOLLY.