

(No Model.)

S. N. CARVALHO.

APPARATUS FOR SUPERHEATING STEAM AND HEATING AIR.

No. 270,281.

Patented Jan. 9, 1883.

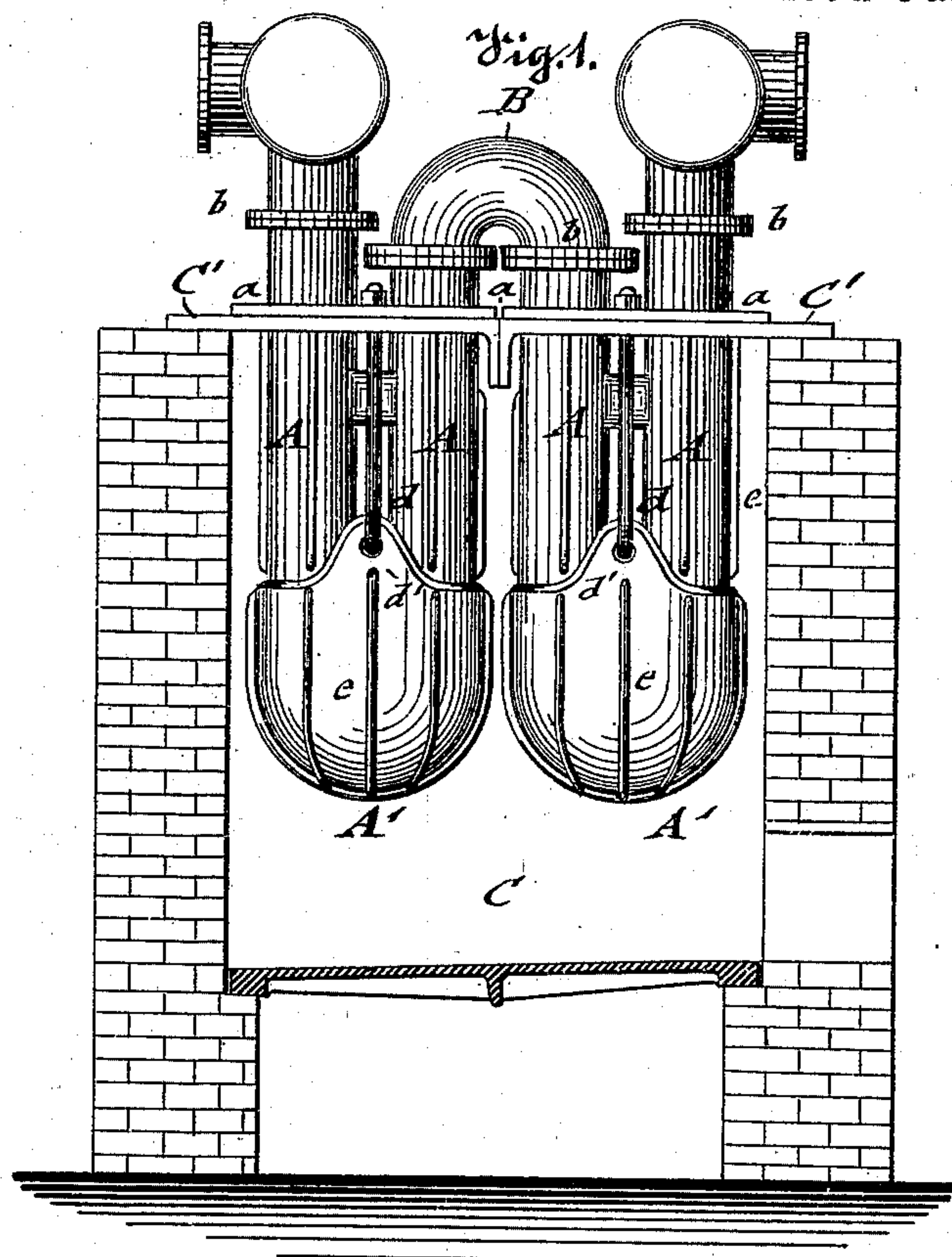
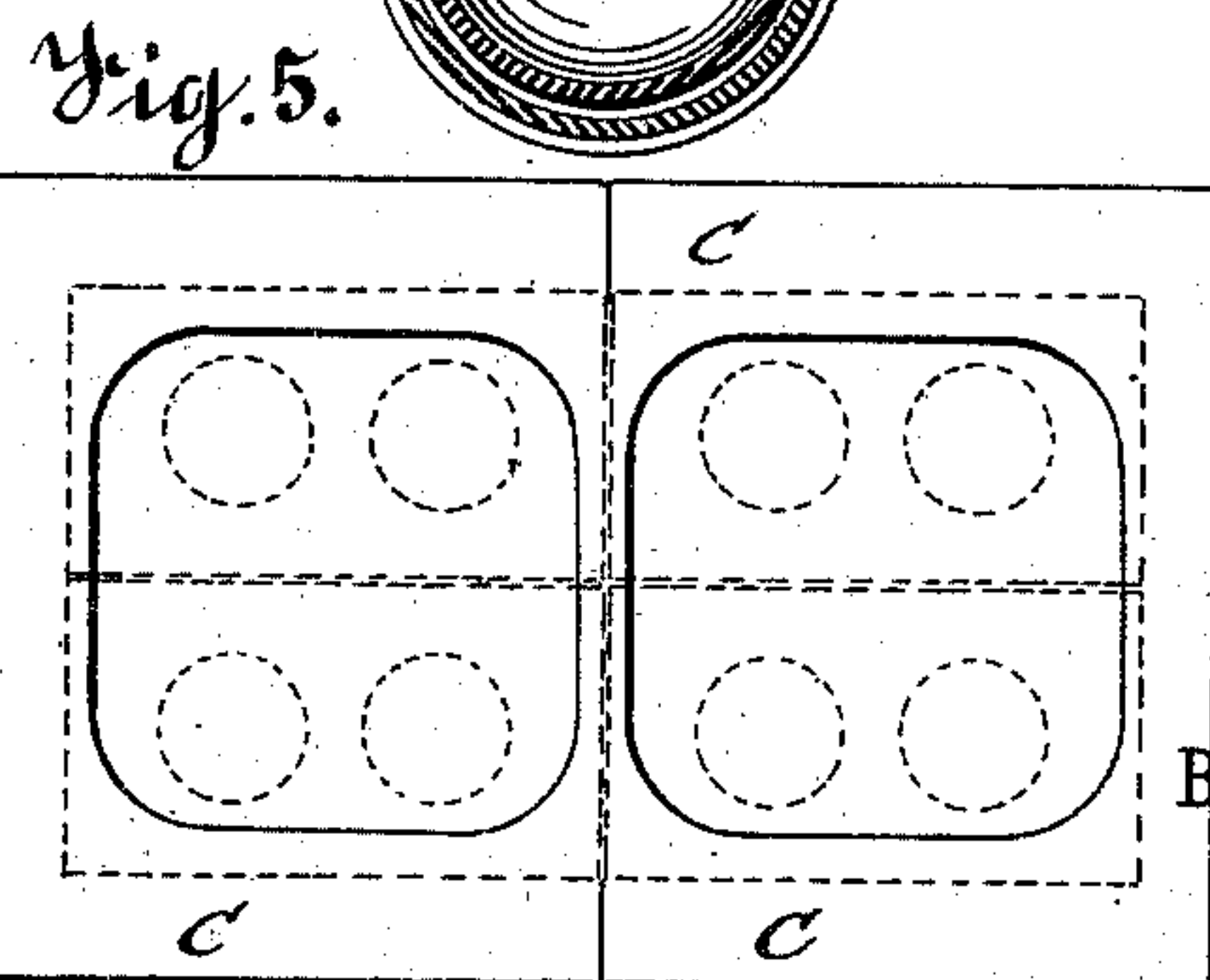
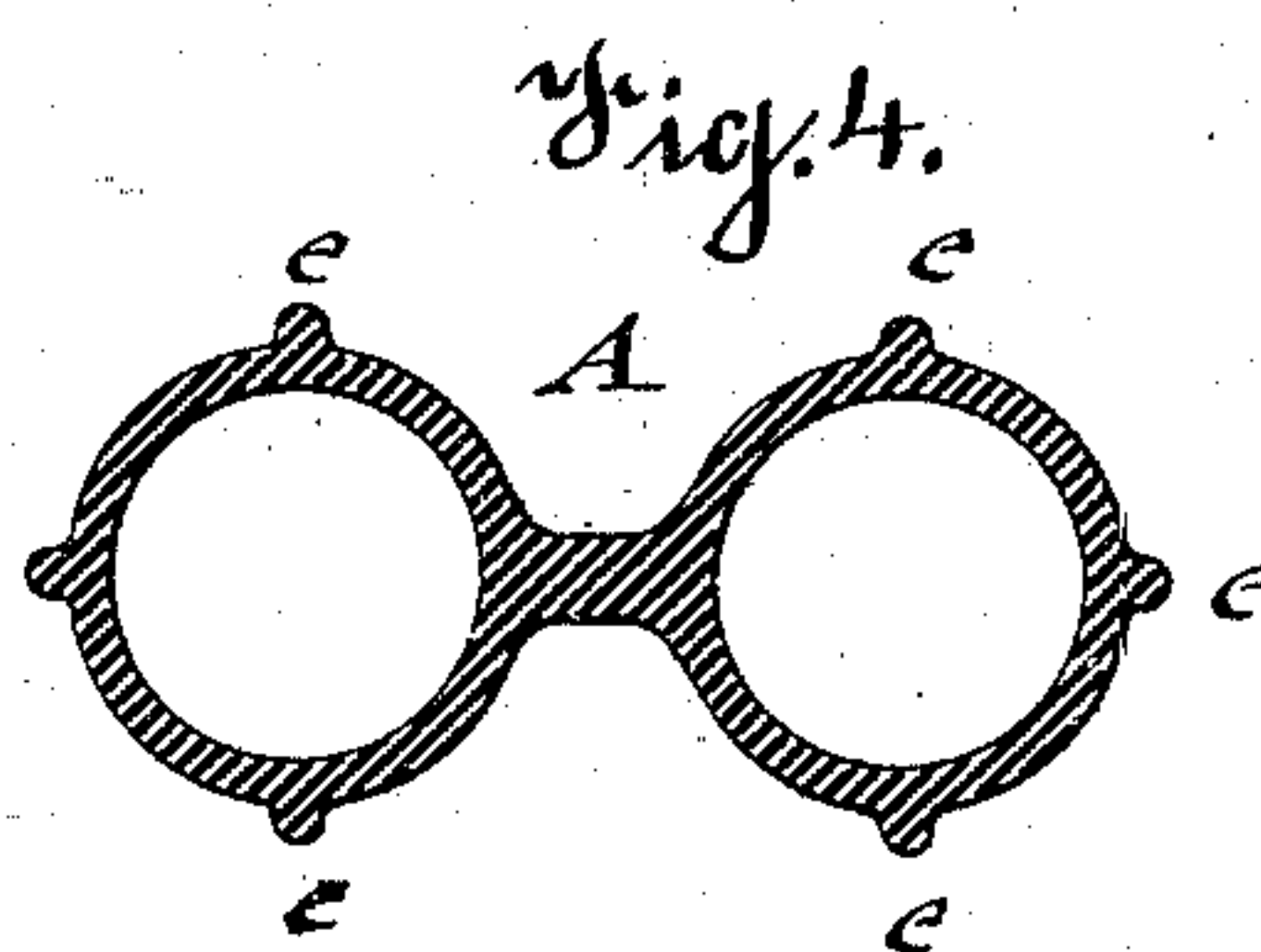
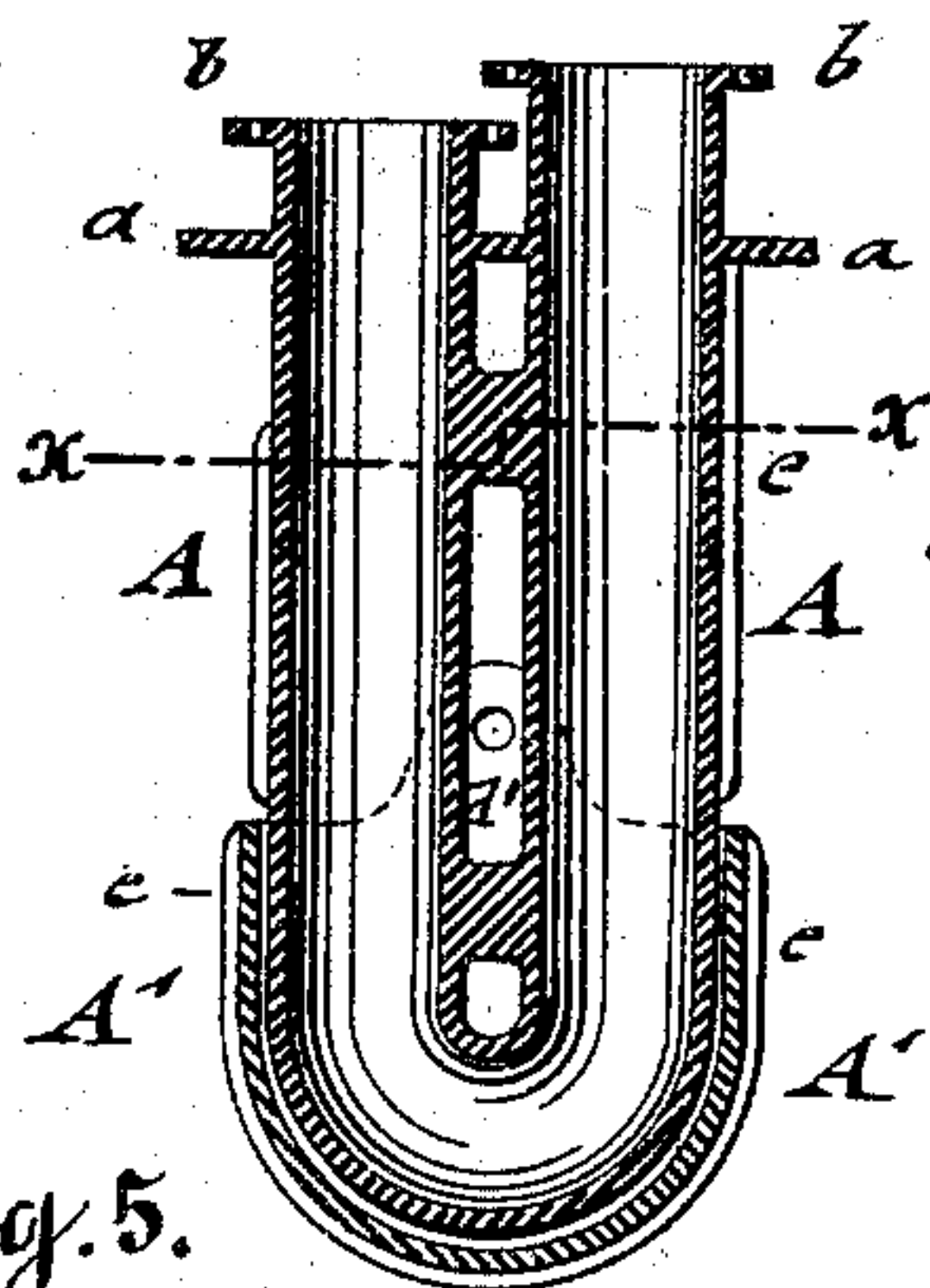
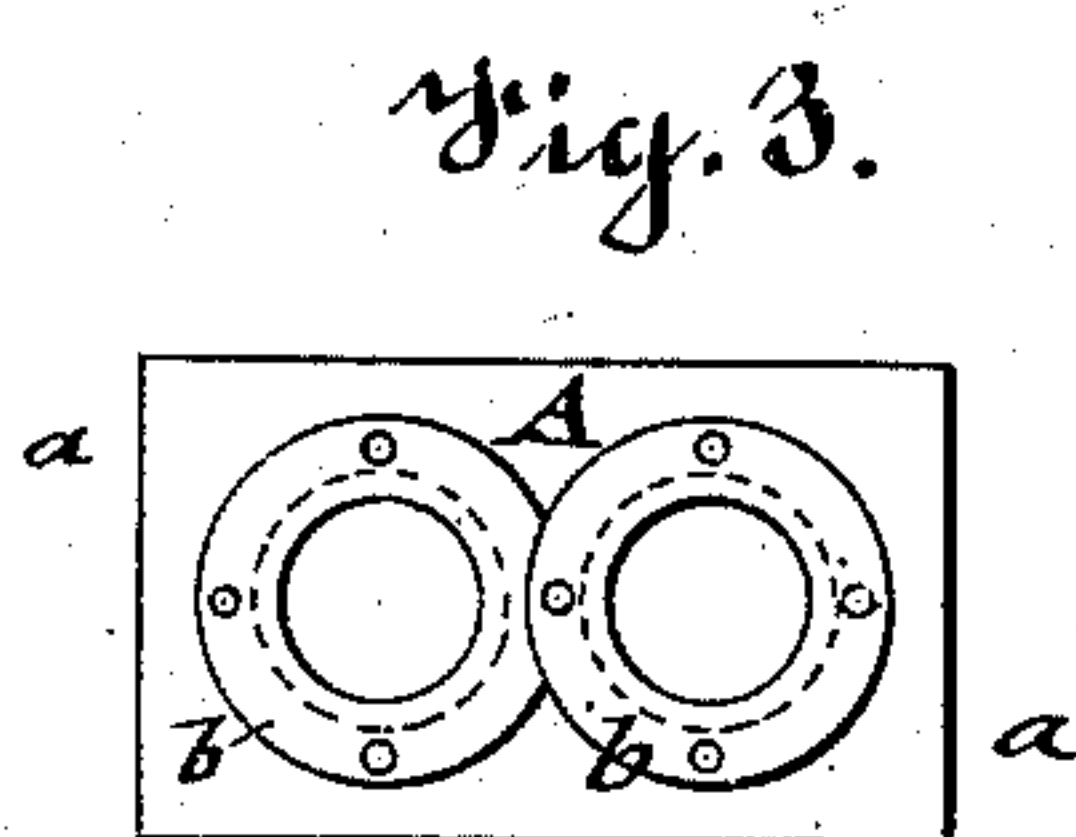


Fig. 2.



WITNESSES;

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APPARATUS FOR SUPERHEATING STEAM AND HEATING AIR.

SPECIFICATION forming part of Letters Patent No. 270,281, dated January 9, 1883.

Application filed April 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON N. CARVALHO, of the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Superheating Steam and Heating Air, of which the following is a specification.

This invention has reference to improvements in the apparatus for superheating steam or heating air for which Letters Patent of the United States have been granted to me, No. 249,502, and dated November 15, 1881, the improvements being designed with a view to simplify the construction of the apparatus and render the same less expensive; and the invention consists of a U-shaped retort, which is provided at the lower or bent part, where it is exposed to the fire, with a jacket or covering, which is attached thereto by suitable means. The retort is supported by a collar or plate, cast in one piece with the retort, upon the top plate of the furnace. The U-shaped retort is extended above the top plate and provided with flanges for making the connections with the steam or air conducting pipes.

In the accompanying drawings, Figure 1 represents a side elevation of my improved apparatus for superheating steam or heating air. Fig. 2 is a vertical central section of a retort; Fig. 3 a top view, and Fig. 4 a horizontal section on line *x x*, Fig. 2, of the retort; and Fig. 5 is a top view of the top plate of the furnace.

Similar letters of reference indicate corresponding parts.

My improved apparatus for superheating steam or heating air is composed of one or more retorts, A A, which are preferably arranged in battery, and are heated by the fire of a furnace, C, upon the cast-iron top plate, C', of which they are supported by a collar or plate, *a*. Each retort A is made of U shape (of any suitable material) or cross-section, and preferably cast in one piece, with the collar *a* at the upper part. The legs of the retort are extended above the top plate, C', and provided with flanged ends *b*, for making the connection with the next adjoining retort, or the steam or air conducting pipes. The adjoining legs of two retorts, A A, are connected by semicircular pipe bends or couplings B, which are tightly screwed by means of end flanges to the flanged

adjoining legs of the retorts A A. The outer legs of the retorts are preferably made longer than the adjoining legs, as shown clearly in Fig. 1, so as to facilitate the connections with the conducting-pipes without the flanges being in the way of each other.

To the bent lower part of each retort A is applied a cast-metal jacket, A', which covers the lower part of the retort as far as the same is exposed to the direct action of the fire, and which prevents the burning out of the lower part of the retort. The jacket or covering A' is applied to the lower part of the U-shaped retort, either by means of suspending-bolts *d*, attached to ears *d'* of the jacket, or by means of transverse keys, or by any other equivalent means whereby the jacket is supported in position on the bottom part of the retort. Whenever the jacket or covering is burned out by use the fastening bolts or keys are removed and the jacket is dropped into the furnace, and thence into the ash-pit, to be removed. A new jacket is then applied to the lower end of each retort, after which the apparatus is again ready for use.

The legs of retorts A, as well as the jackets C, are preferably provided at their outside with longitudinal ribs *e*, whereby a better transmission of the heat from the outside of the retort to the inside is obtained. By making the retort in the shape of a U and casting it in one piece with the connecting-collar and end flanges it can be manufactured with but little cost, while by the use of the jacket full protection is given to the bottom part against the injurious effects of the direct fire.

The apparatus may be used for superheating steam, or for heating air, as required, the latter being adapted for drying lumber, grain, or other substances, and for all other applications in the arts in which air of high temperature may be advantageously and economically used in place of steam.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus for superheating steam or heating air, a retort made of U shape and provided with a jacket or covering applied to the lower part thereof, substantially as and for the purpose set forth.

2. In an apparatus for superheating steam

or heating air, a U-shaped retort provided with a supporting collar or plate at the upper part, and with flanges at the ends, substantially as set forth.

5 3. In an apparatus for superheating steam or heating air, a U-shaped retort having end flanges, *b*, a supporting collar or plate, *a*, and exterior ribs, *c*, in combination with a jacket or covering, *C*, having exterior ribs, and with
10 means for attaching it to the lower part of the retort, substantially as specified.

4. A retort for superheating steam or heat-

ing air, made of U shape, and provided with a supporting top plate, *a*, connecting the legs of the retort, and connected flanges at the up- 15 per ends, all cast in one piece without joint, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

SOLOMON N. CARVALHO.

Witnesses:

PAUL GOEPEL,
CARL KARP.