

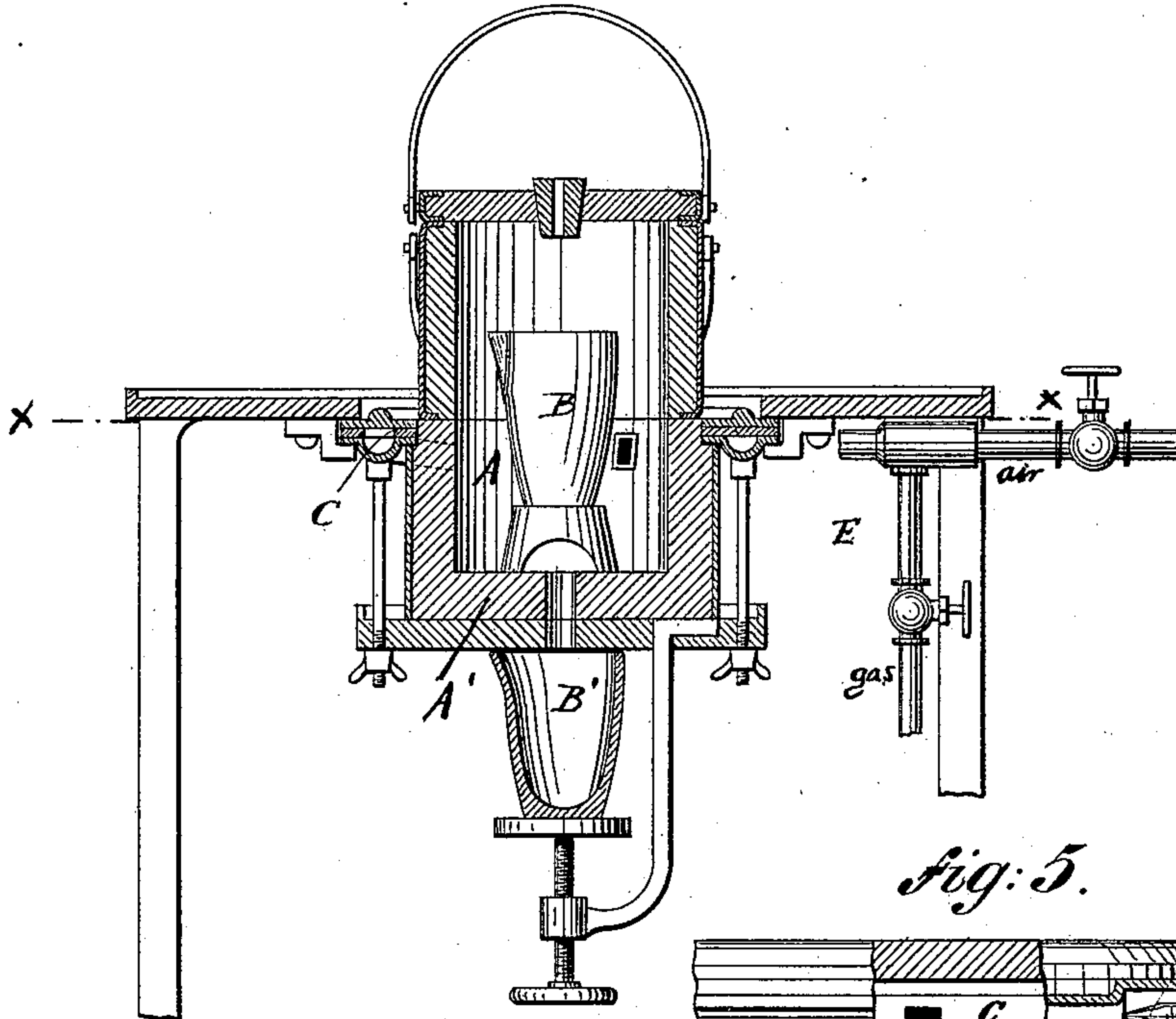
(No Model.)

E. P. REICHHELM.  
GAS FURNACE.

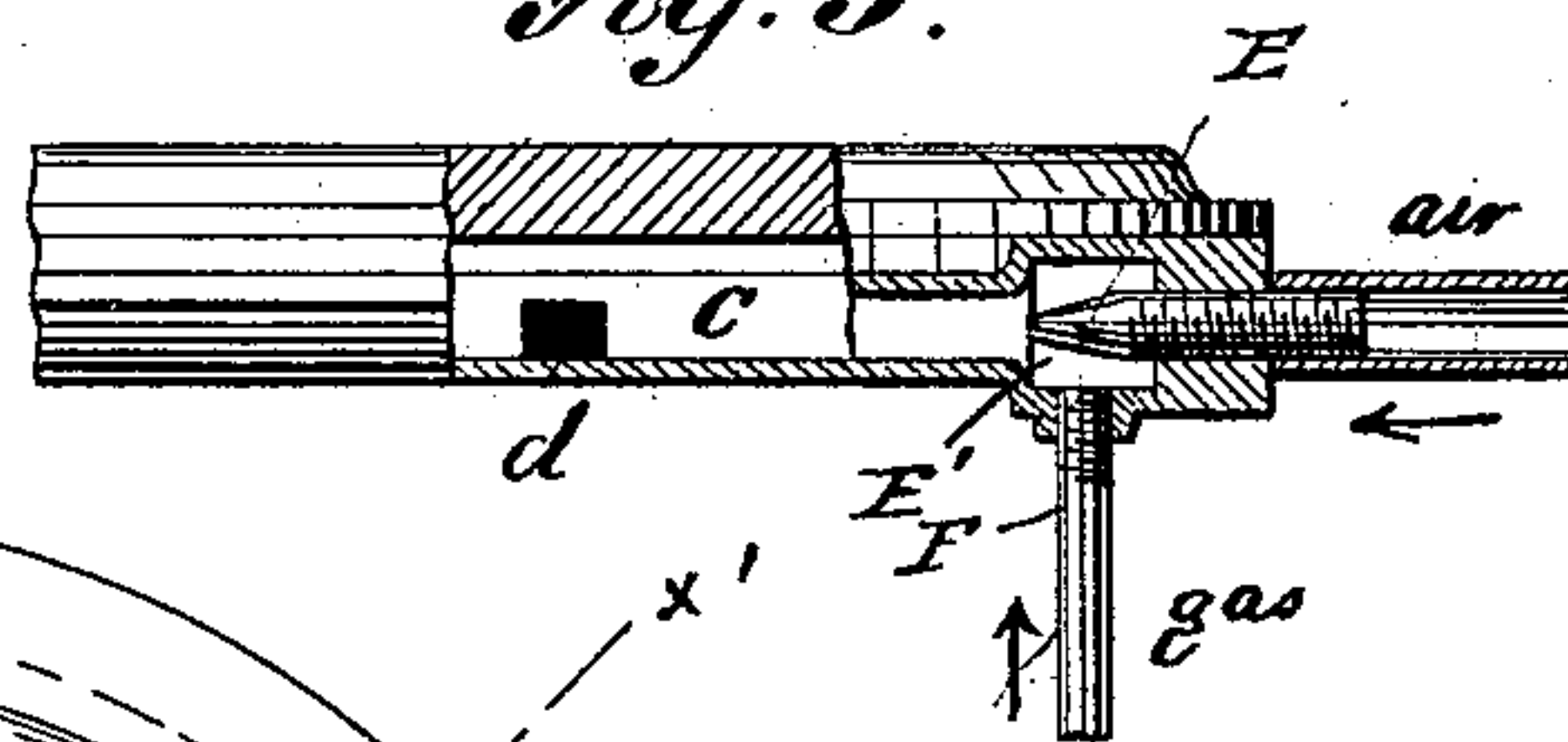
No. 405,051.

Patented June 11, 1889.

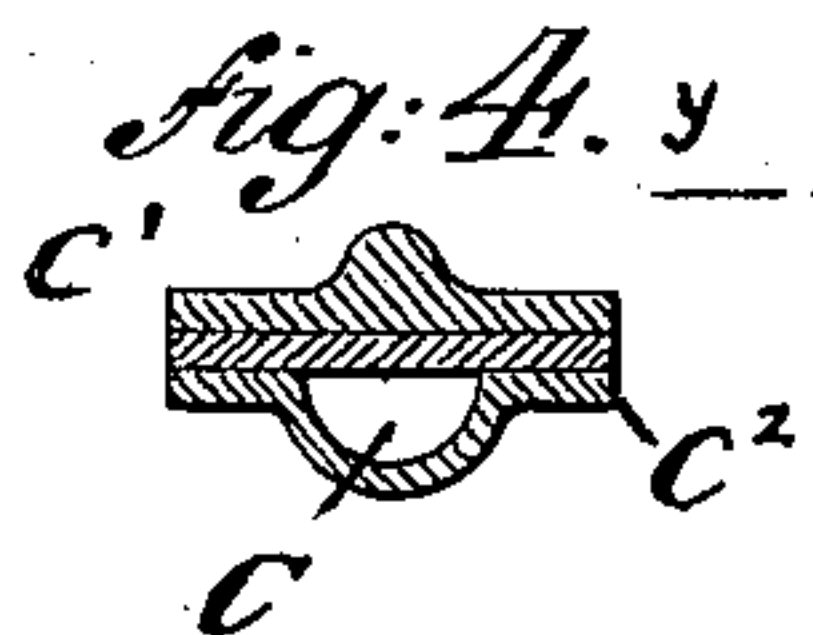
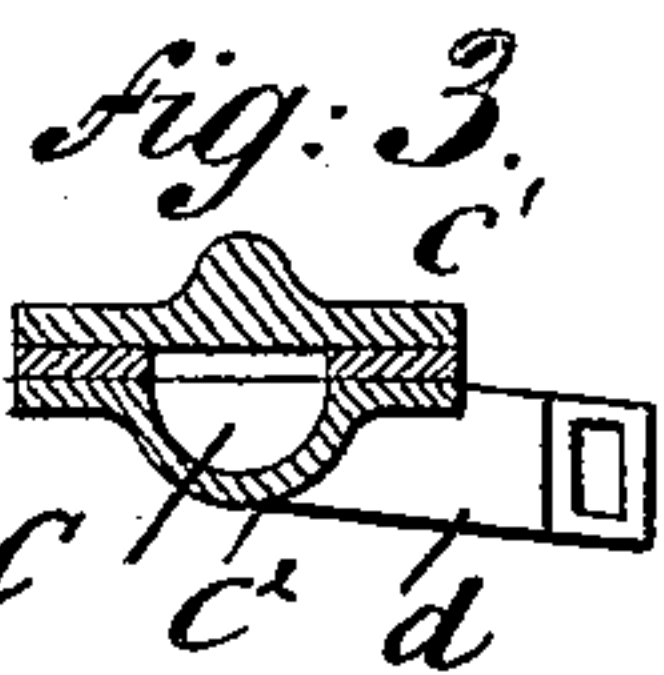
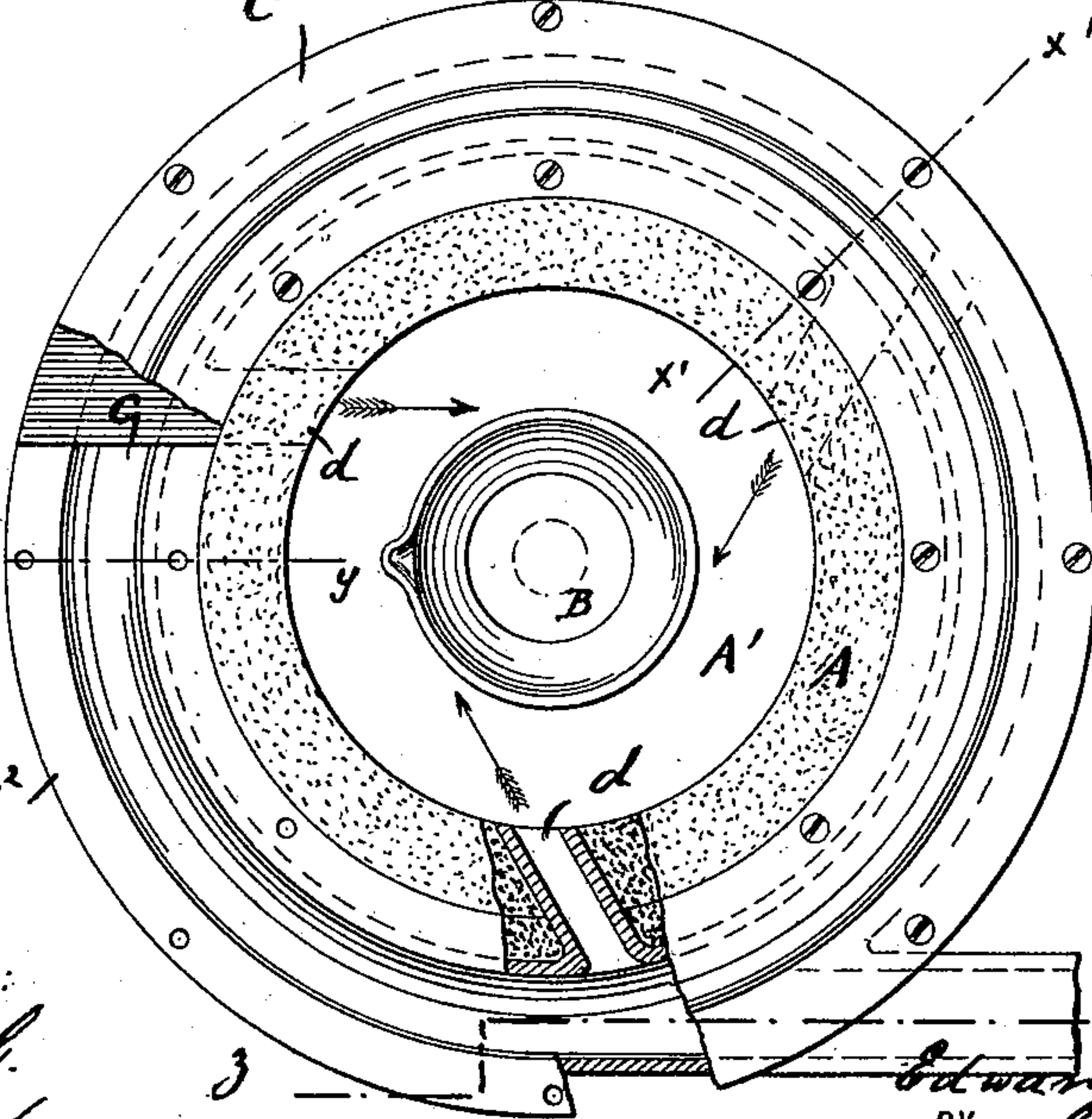
*Fig. 1.*



*Fig. 5.*



*Fig. 2.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWARD P. REICHELME, OF JERSEY CITY, NEW JERSEY.

## GAS-FURNACE.

SPECIFICATION forming part of Letters Patent No. 405,051, dated June 11, 1889.

Application filed December 8, 1888. Serial No. 292,975. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD P. REICHELME, a citizen of the United States, residing in Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Gas-Furnaces, of which the following is a specification.

This invention relates to an improved burner for gas-heated metallurgical furnaces, so that a high degree of heat, as required for melting, plating, annealing, &c., is obtained in a quick and effective manner by supplying a mixture of gas and air pressure to the same.

In the accompanying drawings, Figure 1 represents a vertical central section of a metallurgical furnace with my improved burner for heating the same. Fig. 2 is a horizontal section of the furnace on line  $xx$ , Fig. 1, drawn on a larger scale and with parts broken out. Figs. 3 and 4 are vertical transverse sections through the burner on lines  $x'x'$  and  $yy$ , Fig. 2, respectively. Fig. 5 is a vertical section on line  $zz$ , Fig. 2, showing the injector for supplying the gas-and-air mixture to the burner.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the combustion-chamber of a gas-heated furnace for melting, blowing, annealing, and other metallurgical purposes.

The combustion-chamber A is made of any approved construction, as required for the purpose for which it is to be used. In the combustion-chamber is arranged the crucible B, in which the metal is to be melted, or any other support upon or in which the metals to be treated are placed. Below the apertured bottom A' of the combustion-chamber (shown in Fig. 1) is supported a second crucible B', into which the molten metal is discharged in case the crucible in the inside of the furnace should crack or break.

The furnace is heated by a mixture of gas and air injected under pressure by means of a burner which is formed of a ring-shaped distributing-chamber C, that encircles the combustion-chamber A, the distributing-chamber being made of two sections C' C<sup>2</sup>, which are screwed together, the lower section C<sup>2</sup> being cast or otherwise provided with in-

wardly-inclined burner-tubes  $d d$ , which pass at a suitable angle through the refractory wall of the furnace to the interior of the same, as shown in Fig. 2. The supply of air is furnished by a blower or air-compressor, which injects the air through a nozzle E into a mixing-chamber E', into which the gas-supply pipe F terminates. The partial vacuum formed by the discharge of the air from the nozzle E draws the gas into the chamber E' and from the same into the annular distributing-chamber C, discharging the gas-and-air mixture through the burner-tubes  $d$  into the chamber A. The angle of inclination of the burner-tubes to the distributing-chamber C is such that the flames impinge tangentially to the crucible, and produce thereby a continuous lapping contact with the same. If three burner-tubes are arranged, a continuous lapping around of the flames and reverberating of the same is obtained, whereby not only a higher degree of heat is obtained in the chamber A, but the flames act with less deteriorating action on the crucible than if the flames were impinged at right angles on the same. When the proportion between the size of the combustion-chamber, the discharge-opening of the burner-tubes, the injector, and the pressure of the air is established, a very effective gas-heating furnace for metallurgical purposes is obtained, in which a high temperature can be produced in a quick and effective manner, and all metallurgical operations be performed at great convenience and with a considerable economy in fuel.

When my improved furnace is applied to muffle-furnaces—such as are used for assaying, enameling, cupelling, and annealing metals—the tangential burner prevents the penetrating of the products of combustion through the pores of the muffle, which takes place when the flames strike the muffle either directly or are in contact with it, and the burner-tubes, owing to their downward inclination, tend to throw the circuit of flame downward, so as to envelop the lower part of the muffle.

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

1. The combination of a combustion-chamber and a ring-shaped distributing-chamber, said ring-shaped distributing-chamber being

constructed in two circular sections, one section of which is provided with burner-tubes extending inwardly through the walls of the combustion-chamber.

- 5 2. The combination of a combustion-chamber, an annular distributing-chamber surrounding the combustion-chamber, and a number of burner-tubes extending inward from the distributing-chamber through the walls  
10 of the combustion-chamber, said burner-tubes

being disposed tangentially to a circle within the combustion-chamber and inclined downward from the distributing-chamber.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 15

EDWARD P. REICHHHELM.

Witnesses:

PAUL GOEPEL,  
CARL KARP.