

C. F. R. VON KOCH.

METHOD OF AND MEANS FOR HEATING GASES TO HIGH TEMPERATURES.
APPLICATION FILED JUNE 10, 1911.

1,065,144.

Patented June 17, 1913.

Fig. 1.

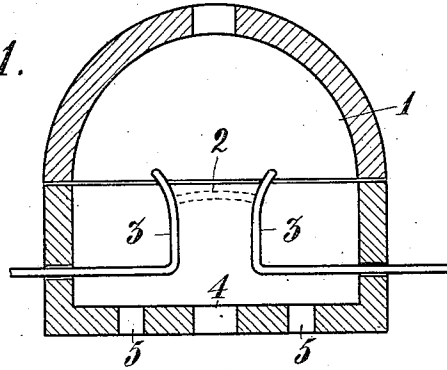


Fig. 2.

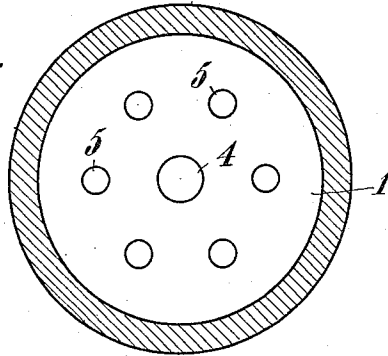
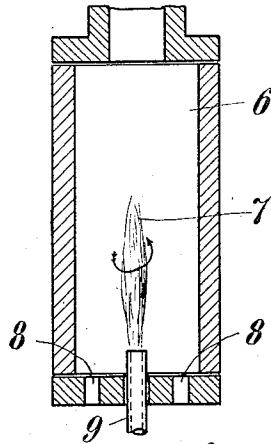


Fig. 3.

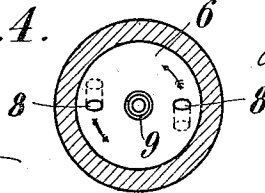


Witnesses

Laura Johnson.

Emanuel Johnson

Fig. 4.



Inventor

Carl Felician Richard von Koch

UNITED STATES PATENT OFFICE.

CARL FABIAN RICHERT VON KOCH, OF STOCKHOLM, SWEDEN.

METHOD OF AND MEANS FOR HEATING GASES TO HIGH TEMPERATURES.

1,065,144.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed June 10, 1911. Serial No. 632,463.

To all whom it may concern:

Be it known that I, CARL FABIAN RICHERT VON KOCH, a subject of the King of Sweden, residing at Stockholm, in the Kingdom of Sweden, have invented a new and useful Method of and Means for Heating Gases to High Temperatures, of which the following is a specification, reference being had to the drawing accompanying and forming a part hereof.

It is well known in the art that in furnaces for heating gases to high temperatures, for instance for producing reactions in gases, a higher thermic effect and thus an increased output may be obtained by preparatorily heating the gas or gases to be treated in the furnace.

The object of the invention is to make it possible to combine the aforesaid advantages of preparatorily heating the gas or gases to as high temperature with that of an effective insulation of the walls or other parts of the furnace in respect of heat and electricity.

The invention consists, chiefly, in supplying heated gas or gases to the zone or zones of the furnace in which further heating is to be effected and at the same time supplying comparatively cool gas or gases around about the said zone or zones.

In carrying the invention into effect any furnace suitable for heating gases, or adapted to work with heated gases, may be employed. Preferably, the furnace is provided with one or more central openings for supplying heated gas or gases and one or more openings surrounding the former for introducing comparatively cool gas or gases.

In the drawing, I have shown, by way of example, two furnaces embodying the invention.

Figure 1 is a vertical and Fig. 2 is a horizontal section of the one furnace. Figs. 3 and 4 are similar views of the second furnace.

Referring first to Figs. 1 and 2, 1 is the furnace in which an electric arc 2 is formed between the electrodes 3. The heated gas is supplied through the central opening 4 in the bottom of the furnace, whereas gas of a lower temperature, for instance that of the outer air, is supplied through openings 5 surrounding the central opening 4. The cool gas forming a cover around about the heated gas supplied to the zone of the electric arc and further heated by the same will

thus protect the electrodes, the walls of the furnace and adjacent parts, reduce the losses of heat from the furnace and prevent discharge of the electric current to the wall of the furnace or parts of the furnace situated outside the hot zone.

An increased action may be obtained by imparting a rotary movement to the gases supplied to the furnace. In Figs. 3 and 4 I have shown an example of such an arrangement employed in a furnace 6 whose source of energy 7, consisting of an electric arc, a gas flame or other hot body, extends in the direction of the gas current. The cool gas or gases are supplied through openings 8 one or more of which extend tangentially or obliquely so as to impart a rotary movement to the said gas or gases. The heated gas which may or may not have a rotary motion is supplied through the opening 9. On account of the rotation, the cool gas or gases sweep along the walls of the furnace while the gas supplied at the center, due to its higher temperature or its lower specific weight, remains at and about the axis of rotation.

The preparatory heating of the gas may be effected in several ways, for instance by causing it to pass along a heated part of the furnace, by separate sources of heat or, preferably, by utilizing the heat of the exhaust gases. The parts of the furnace, electrodes, etc., situated within the zone in which the heated gas is introduced may, obviously, be protected by separate insulation or cooling from being too strongly heated. The supply openings for the gases may be placed in the bottom of the furnace or in the walls thereof or in both, as shown in the drawing, and they may be made as separate openings or slits arranged in groups, or in the shape of arcs, or otherwise, or as continuous slits, preferably annular in shape.

I claim:

1. The process of heating gas to a high temperature, which consists in preheating the gas, inclosing said preheated gas in an envelop of comparatively cool gas, and advancing said preheated gas and its inclosing envelop in the same direction past a further source of heat, meanwhile subjecting the said preheated gas to said further source of heat.

2. The process of heating gas to a high temperature, which consists in preheating the gas, inclosing said preheated gas in a

rotating envelop of comparatively cool gas, and subjecting the said inclosed preheated gas to a further source of heat.

3. A furnace for heating gases having
5 openings for introducing hot gas and openings surrounding the former for introducing cool gas, and comprising means for raising the temperature of the hot gas supplied through the first-mentioned opening.

10 4. A furnace for heating gases having a supply opening for hot gas and obliquely placed supply opening for cool gas, and comprising means for raising the tempera-

ture of the hot gas supplied through the first-mentioned opening.

5. The process of heating gas to a high
15 temperature, which consists in preheating the gas, inclosing said preheated gas in an envelop of comparatively cool gas, and then subjecting the inclosed preheated gas to a
20 further source of heat.

CARL FABIAN RICHERT VON KOCH.

Witnesses:

LAURA JOHNSON,

EMANUEL JOHNSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."