

No. 644,369.

Patented Feb. 27, 1900.

F. W. C. SCHNIEWIND.
REGENERATIVE COKE OVEN.

(Application filed Nov. 23, 1898.)

(No Model.)

Fig. 1.

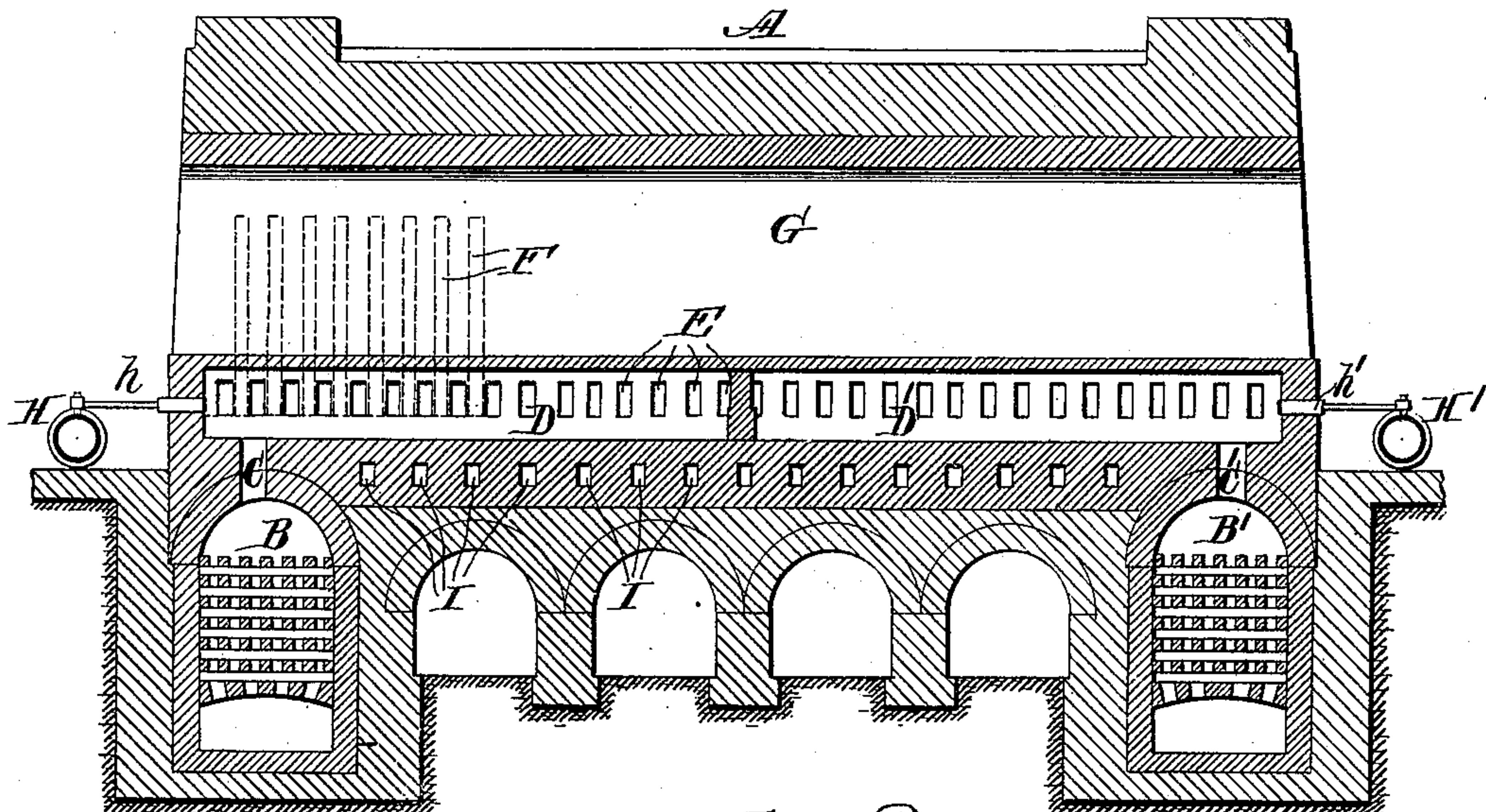


Fig. 2.

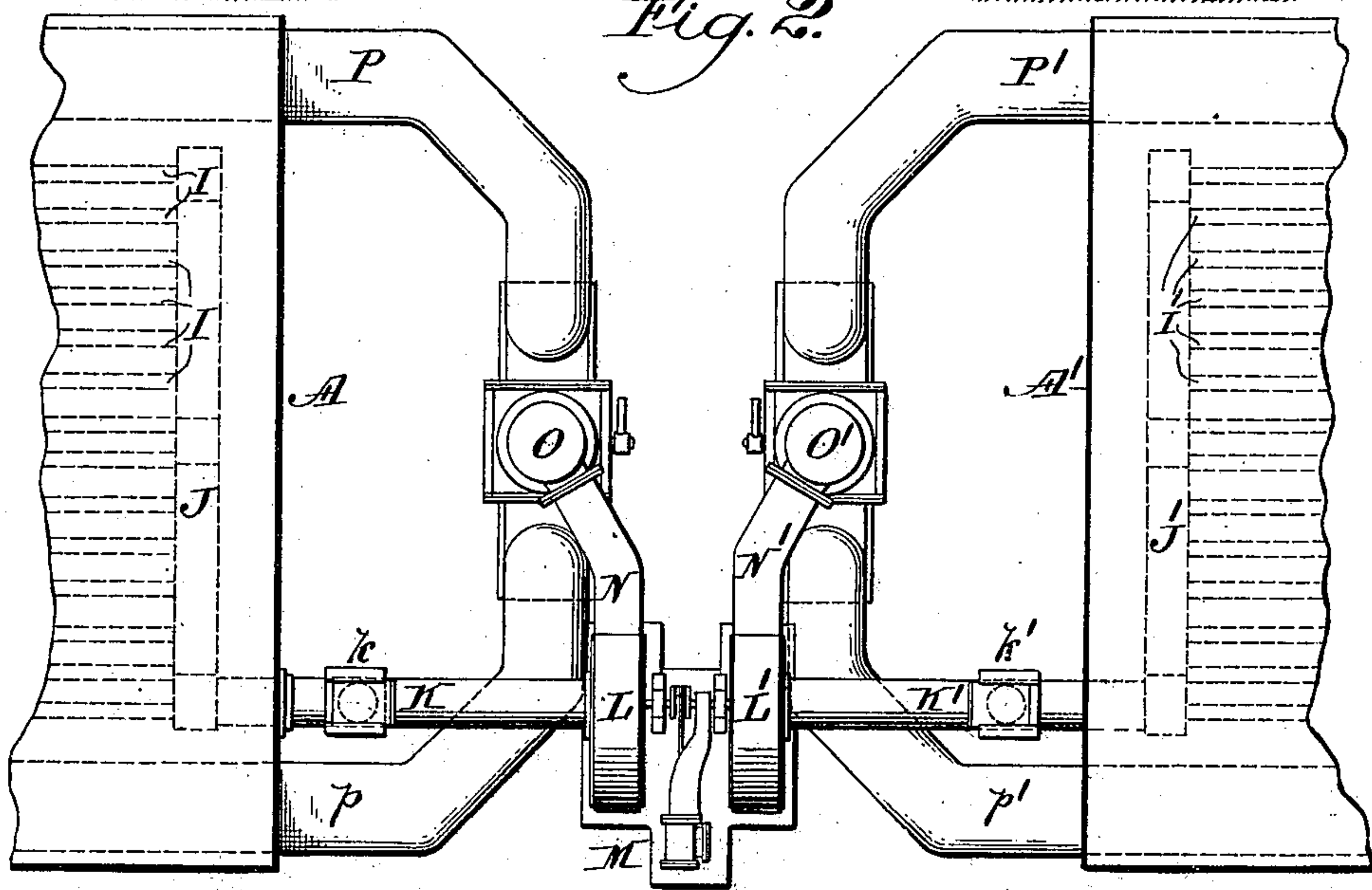
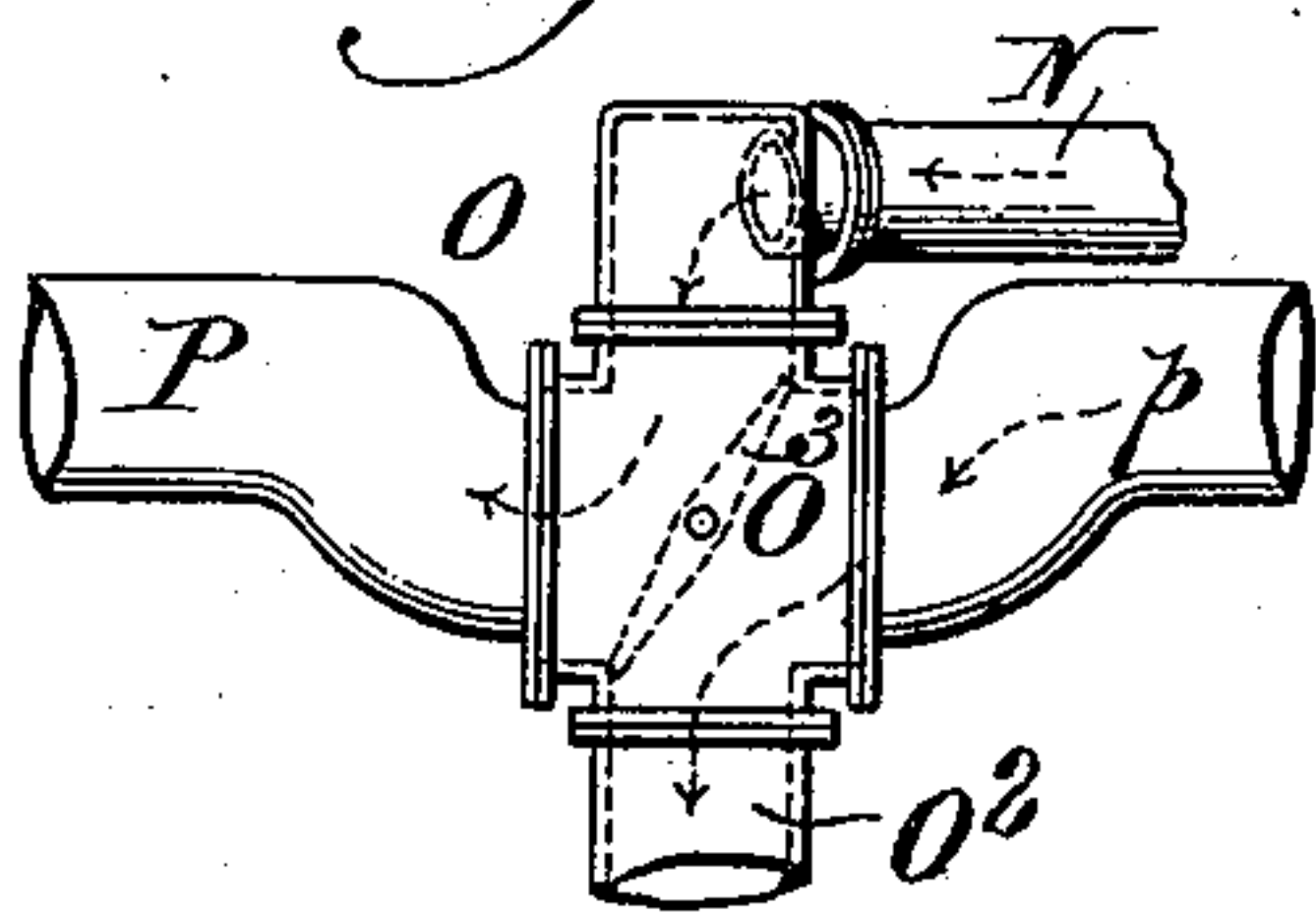


Fig. 3.



Witnesses.

Harry Denny
Shewart

Inventor.

Francis W. C. Schniewind
by
Francis J. Chambers
his Attorney.

UNITED STATES PATENT OFFICE.

FREDERIC W. C. SCHNIEWIND, OF EVERETT, MASSACHUSETTS, ASSIGNOR
TO THE UNITED COKE AND GAS COMPANY, OF PHILADELPHIA, PENN-
SYLVANIA, AND CHARLESTON, WEST VIRGINIA.

REGENERATIVE COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 644,369, dated February 27, 1900.

Application filed November 23, 1898. Serial No. 697,227. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC W. C. SCHNIEWIND, a citizen of the United States of America, residing in Everett, in the county of Middlesex, in the State of Massachusetts, have invented a certain new and useful Improvement in Regenerative Coke-Ovens, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to coke-ovens of the kind in which regenerative chambers heated by the escaping products of combustion from furnaces used in heating the ovens are used to preheat the air which is passed to the said furnaces to support combustion. In furnaces of this type, as well as other furnaces in which banks of ovens are heated through their walls by furnaces or flues formed in the masonry, it is found necessary to keep the foundations beneath the ovens and furnaces cooled by means of cooling-flues formed in the masonry and through which cold air is constantly passed; and the object of my invention is to utilize the heat imparted to the air in these cooling-flues to supplement the action of the regenerators and diminish the amount of fuel required to maintain the bank of ovens at the necessary temperature.

Generally speaking, my invention may be said to consist in connecting the cooling-flues with the conduits leading to the regenerators, providing means for directing the hot air coming from the cooling-flues into the proper regenerator, and means for maintaining a proper draft through the cooling-flues to at once insure their proper action and a proper supply of air to the regenerators.

Reference being now had to the drawings, in which my invention is illustrated, Figure 1 is a sectional elevation taken through a bank of furnaces provided with regenerators and cooling-flues, the section being taken in the rear of the transverse flue J—as, for instance, on the dotted line 1 1 at the left of Fig. 2. Fig. 2 is a plan view showing the ends of two adjacent banks of ovens and the construction and mechanism which I have

found it desirable to use in applying my invention, and Fig. 3 is a sectional view of a valve by which the air from the cooling-flues is directed into either of the two regenerators appertaining to each bank of ovens and out of the other regenerator into the stack.

A and A' indicate banks of ovens; B and B', regenerative chambers situated in the front and rear of each bank and connecting through passages C and C' with the combustion-chambers D D'. In the arrangement shown in Fig. 1 the combustion-chambers connect, through flues E, with vertical partitions, (indicated by dotted lines at F,) which in turn are situated in heating-flues extending between each adjacent pair of ovens, the view in Fig. 1 being taken through one of the ovens, which is indicated at G.

H and H' indicate gas-mains supplying gas to the combustion-chambers D D' through burners h and h'.

I I, &c., indicate cooling-flues formed in the masonry beneath the ovens or furnaces and combustion-chambers. These flues may be of any convenient construction, and according to the usual practice they are open at one end and connect at their other ends with vertical chimneys or flues leading out of the top of the masonry bank and which maintain a draft through the cooling-flues. In place of these chimneys I preferably lead the flues I into common collecting-flues J or J', from which in turn lead pipes K K', connecting with suction-fans, as indicated at L and L', N and N' being the discharge-pipes of the fans which lead to a valve-chamber O or O', in each of which is situated a butterfly-valve o³, as shown in Fig. 3. With the chamber O are connected the conduits P p, leading to the lower parts of the regenerative chambers B B' of one bank of ovens, and with the chamber O' are connected the conduits P' p', leading to the regenerative chambers of the other bank of ovens.

k and k' indicate regulable air-passages leading into the pipes K and K' and by means of which air independent of the supply drawn through the cooling-flues may be supplied to the regenerative chambers.

O² is a conduit leading to the stack.

In operation the fans L will keep a constant current of air passing through the cooling-flues, which of course are freely open to the atmosphere at their ends opposite to those terminating in the common flues J or J', and too-energetic cooling of the masonry bank is avoided by admitting cool air to the passages *k* or *k'* in such quantity as may be desirable to proportionately diminish the flow through the cooling-flues I, and the adjustments of the valve (indicated at O³, Fig. 3) will cause the hot air to pass through the valve-chamber into the pipe P or *p* and thence to the regenerative chamber B or B', as may be desired. The adjustment of the valve to introduce the air, for instance, through pipe P to chamber B will connect the chamber B' through pipe *p* to conduit O², leading to the stack.

Of course instead of drawing or sucking the air through the cooling-passages it may be forced through them under pressure, in which case, however, the independent air-supply, if it is desired to introduce it into the conduit K, must be forced rather than drawn therein.

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

1. In combination with a bank of coke-ovens having regenerators for preheating the air and to support combustion by the waste heat of the furnaces used for heating the ovens, air-supply conduits as P and *p* leading to each regenerator, a system of cooling-flues situated in the masonry beneath the ovens and furnaces, a conduit as K connecting said flues with conduits P and *p*, a valve as O whereby the connection to either conduit can be closed at will and means as specified whereby the air is drawn through the cooling-flues into the supply-conduit connected thereto and into the appropriate regenerator.

2. In combination with a bank of coke-ovens having regenerators for preheating the air and to support combustion by the waste heat of the furnaces and for heating the ovens, air-supply conduits as P and *p* leading to each regenerator, a system of cooling-flues situated in the masonry beneath the ovens and furnaces, a conduit as K connecting said flues with conduits P and *p*, a valve as O whereby the connection to either conduit can be closed at will, a regulable air-passage independent of the cooling-flues opening into the pipes or conduits connecting said flues with the regenerators, and means as specified whereby the air is drawn through the cooling-flues and air-passage into the supply-conduit connected thereto and into the appropriate regenerator.

3. In combination with a bank of coke-ovens having regenerators for preheating the air and to support combustion by the waste heat of the furnaces used for heating the ovens, a system of cooling-flues situated in the masonry beneath the ovens and furnaces, a collecting-fan for drawing air through said flues, and a discharge-conduit from said fan connecting with the air-supply pipes leading to the regenerators.

4. In combination with a bank of coke-ovens having regenerators for preheating the air and to support combustion by the waste heat of the furnaces and for heating the ovens, a system of cooling-flues situated in the masonry beneath the ovens and furnaces, a collecting-fan for drawing air through said flues, a supplemental air-inlet to the fan independent of the cooling-flues, and a discharge-conduit from said fan connecting with the air-supply pipes leading to the regenerators.

FREDERIC W. C. SCHNIEWIND.

Witnesses:

CHAS. F. MYERS,
D. STEWART.