

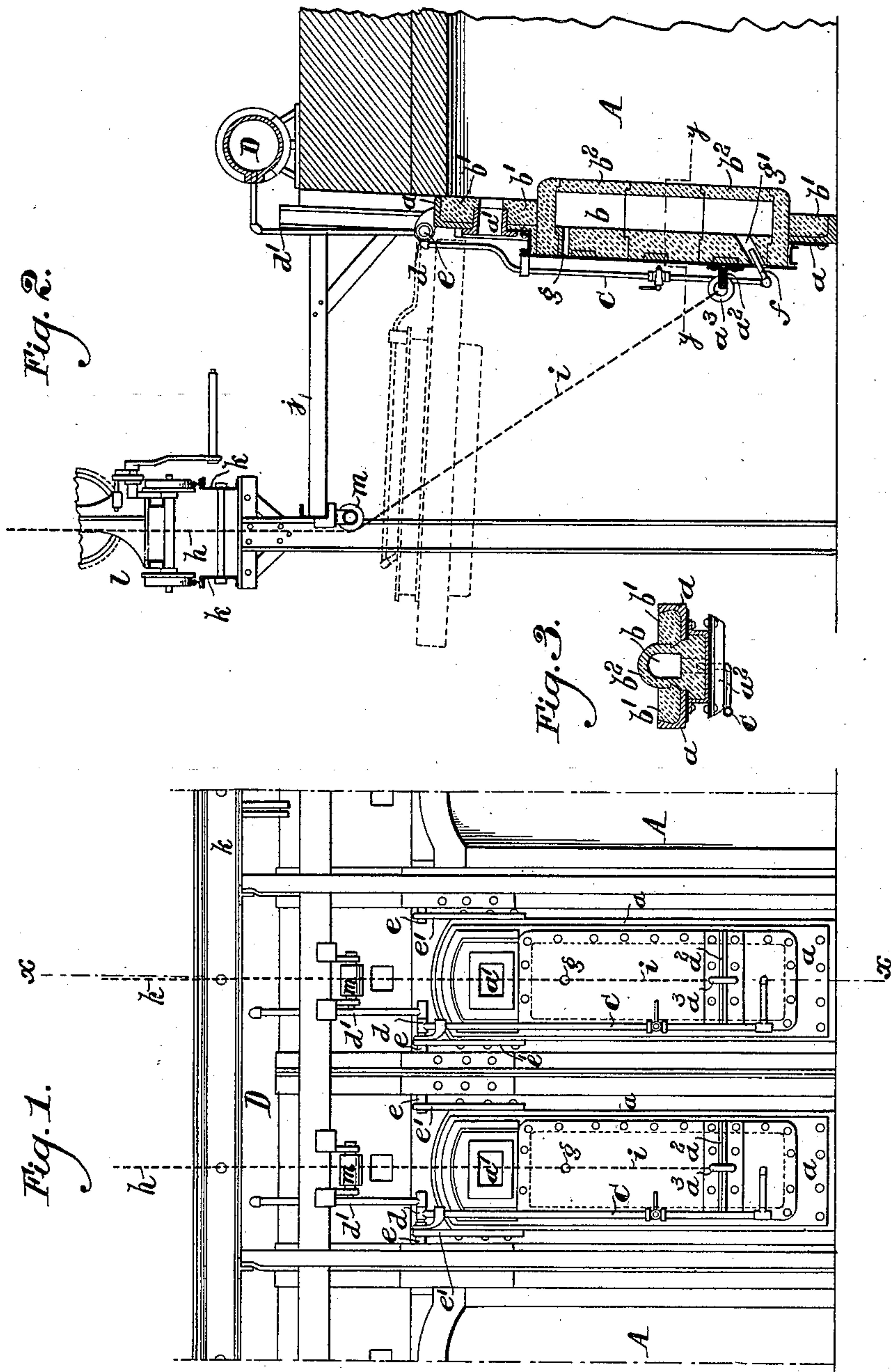
(No Model.)

2 Sheets—Sheet 1.

G. HILGENSTOCK.  
COKE OVEN DOOR.

No. 601,468.

Patented Mar. 29, 1898.



Witnesses.

Harry Denny  
Albany

Inventor.

Gustav Helgenstock  
by Francis T. Chambers

*his* Attorney.

(No Model.)

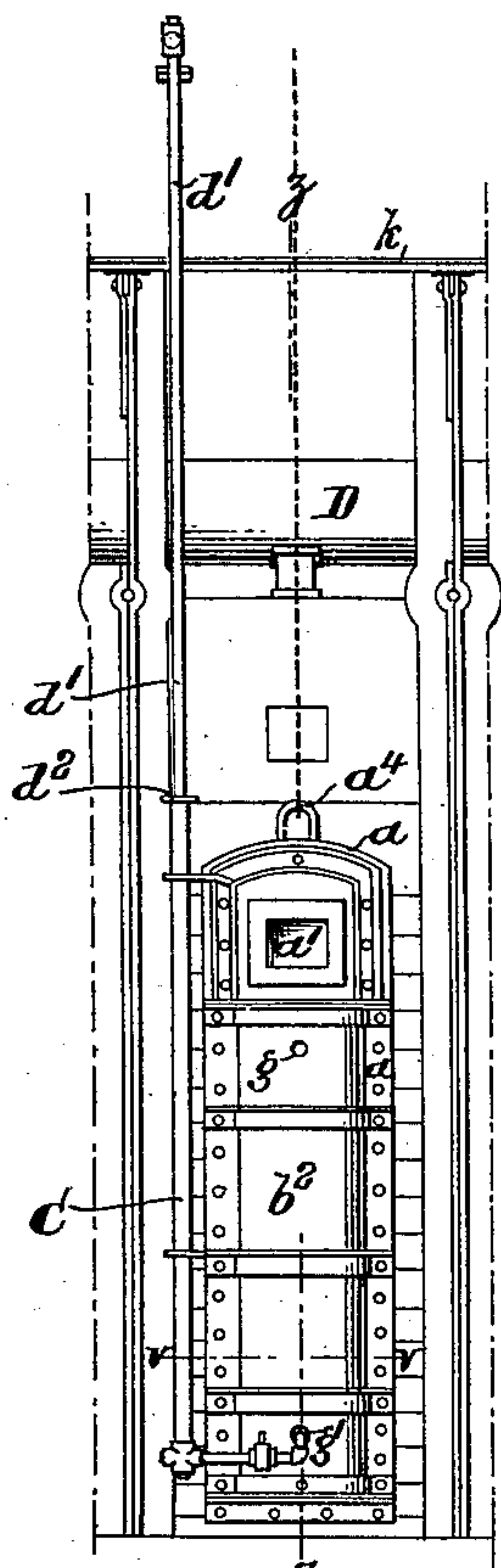
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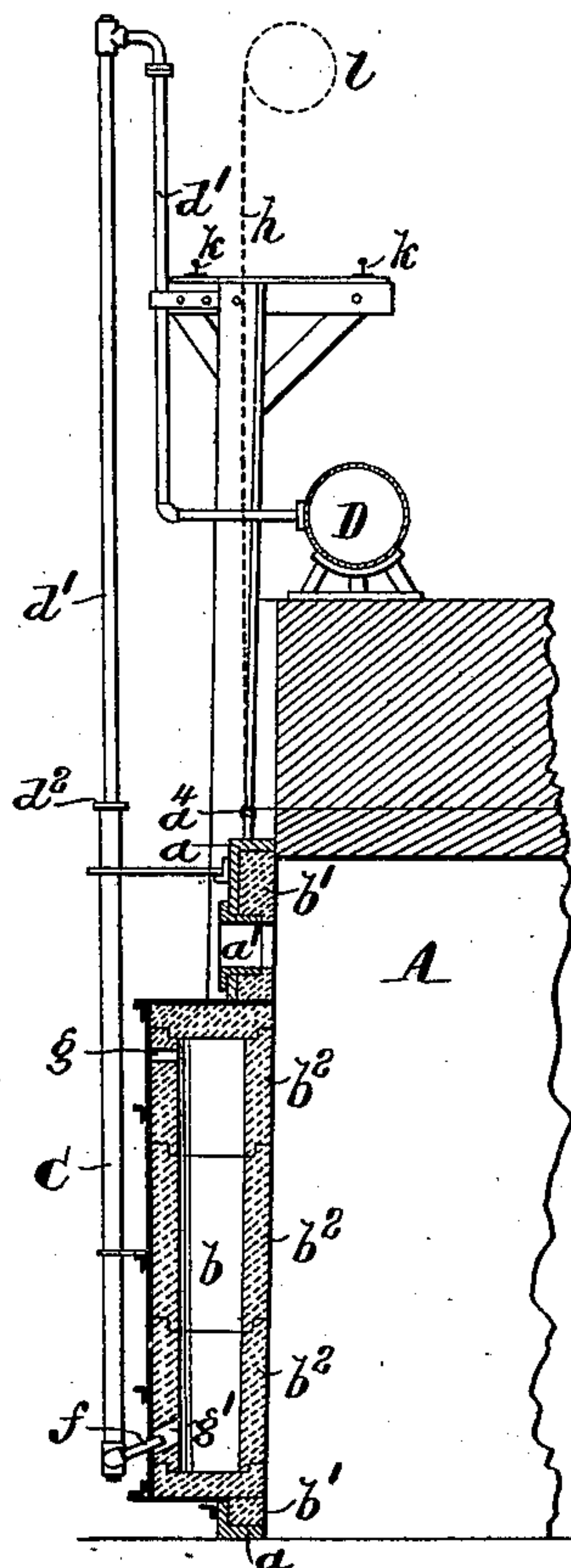
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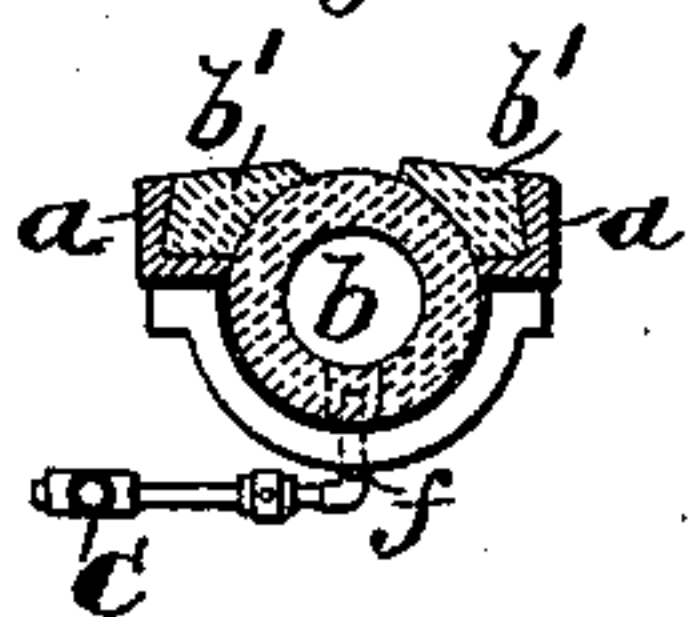
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

GUSTAV HILGENSTOCK, OF DAHLHAUSEN, GERMANY, ASSIGNOR TO THE UNITED COKE AND GAS COMPANY, OF CHARLESTON, WEST VIRGINIA, AND PHILADELPHIA, PENNSYLVANIA.

## COKE-OVEN DOOR.

SPECIFICATION forming part of Letters Patent No. 601,468, dated March 29, 1898.

Application filed January 14, 1897. Serial No. 619,135. (No model.) Patented in Germany October 1, 1895, No. 86,145.

*To all whom it may concern:*

Be it known that I, GUSTAV HILGENSTOCK, a subject of the German Emperor, residing in Dahlhausen-on-the-Ruhe, Westphalia, Germany, have invented a certain new and useful Improvement in Coke-Oven Doors, (for which I have obtained Letters Patent of the German Empire, dated October 1, 1895, No. 86,145,) 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 the construction of coke-ovens, particularly of the type in which the coal is treated in muffle or externally-heated chambers, my object being to secure the complete coking of the portion of the charge of coal which comes in contact with the door or doors of the oven and which heretofore has been, compared with the rest of the charge, imperfectly coked; and with this object in view my invention consists, primarily, in constructing the door or doors of ovens with a lining of refractory material in which I form a combustion-chamber, providing an entrance for gas and an exit for products of combustion, so that the door may be heated to a proper temperature at the same time with the walls proper of the oven.

Another important feature of my invention consists in so combining and arranging the gas-supply pipe by which the combustion-chamber in the door is fed with combustible gases with a fixed portion and with the door that the portion of it which is connected to the door will move with the door as it is opened and closed without interrupting the supply of gas, so that the heating of the oven-door may be practically continuous whether it is opened or closed.

Reference being had to the drawings in which the invention is illustrated, Figure 1 is a front view of a portion of a bank of ovens provided with my improved doors; Fig. 2, a vertical section on the line  $x x$  of Fig. 1; Fig. 3, a cross-section on the line  $y y$  of Fig. 2; Fig. 4, a front elevation showing a modified construction in which the door moves verti-

cally; Fig. 5, a vertical section on the line  $z z$  of Fig. 4, and Fig. 6 a cross-section on the line  $v v$  of Fig. 4.

$a$  in all the figures indicates the front framework of the coke-oven door,  $a'$  being a sight-hole at the top of the door;  $a^2$ , a flange bolted to the lower part of the door, constructed as shown in Figs. 1, 2, and 3;  $a^3$ , a ring secured in this flange and to which the chain is fastened in order to open the door;  $a^4$ , a loop fastened to the top of the door, constructed as in Figs. 4, 5, and 6 and to which the chain is attached for raising and opening this kind of door.

$b$  is the combustion-chamber formed in the refractory lining of the door  $a$ , the lining being made up of fire-brick, as indicated at  $b'$  and  $b^2$ , the bricks  $b^2$  being formed with cavities in them which form the chamber  $b$ .

Where, as in the construction illustrated in Figs. 1, 2, and 3, the door is hinged to the oven, I prefer to form the refractory lining of the door, and particularly that portion of it in which the combustion-chamber  $b$  is formed, so that it will project somewhat into the oven, as indicated; but where the door moves vertically, as in Figs. 4, 5, and 6, it is convenient to form the lining and the chamber  $b$  as indicated in these figures.

$g'$  indicates an entrance-passage for gas and air leading into the bottom of the chamber  $b$ , and  $g$  indicates an exit-opening for products of combustion leading from the top of the said chamber.

$C$  indicates a supply-pipe for gas, which is secured to the door  $a$  and to the lower end of which is secured the burner  $f$ , which projects into the opening  $g'$ .

In the hinge construction of door illustrated in Figs. 1, 2, and 3 the door is hinged at the top of the oven to pins  $e$  by means of hinge-plates  $e'$ , through which these pins pass, and in line with the pins  $e$  I form a hinge-joint, as indicated at  $d$ , connecting the gas-pipe  $c$  to a stationary pipe  $d'$ , which in turn leads into the general supply-pipe  $D$ . By this construction it is obvious that the pipe-section  $c$  will move with the door  $a$  as it turns



upon its hinges and without interrupting the supply of gas to the burner and combustion-chamber.

In the construction shown in Figs. 4, 5, and 6, in which the oven-door moves vertically, the gas-pipe section *c* is secured to the door *a*, as before, but in place of forming a hinge-joint with the stationary pipe-section *d'* it forms a telescopic joint with the said pipe, with the stuffing-box situated at the top of the pipe-section *c*, as indicated at *d''*. By this construction it is obvious that the pipe *c* may move with the oven-door without interrupting the gas-supply.

Of course any convenient means may be used for raising and lowering the oven-doors. In Figs. 1 and 2 I have shown a windlass *l*, mounted on a trolley and moving on trucks *k k*, *j* indicating a platform upon which the operator can walk along in front of and above the ovens. *h* indicates a cable connected with the windlass, and *i* a chain extension running under a roller *n* and connecting with a ring *a''*, while in the construction indicated in Figs.

4 and 5 the truck *k k* is situated immediately above the coke-oven doors, the cable or chain *H* connecting with the loop *a''*.

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

1. A coke-oven in combination with a door lined with refractory material and having a combustion-chamber as *b* formed therein with passages for the introduction of gas and escape of products of combustion.

2. A coke-oven in combination with a door lined with refractory material and having a combustion-chamber as *b* formed therein with passages for the introduction of gas and escape of products of combustion and a gas-supply pipe leading into said combustion-chamber and jointed as specified so as to move with the door without cutting off the gas-supply thereto.

GUSTAV HILGENSTOCK.

Witnesses:

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