No. 680,521. Patented Aug. 13, 1901.

A. L. FOY.

FURNACE.

(Application filed May 16, 1901.)

(No Model.)

Fig. 1.

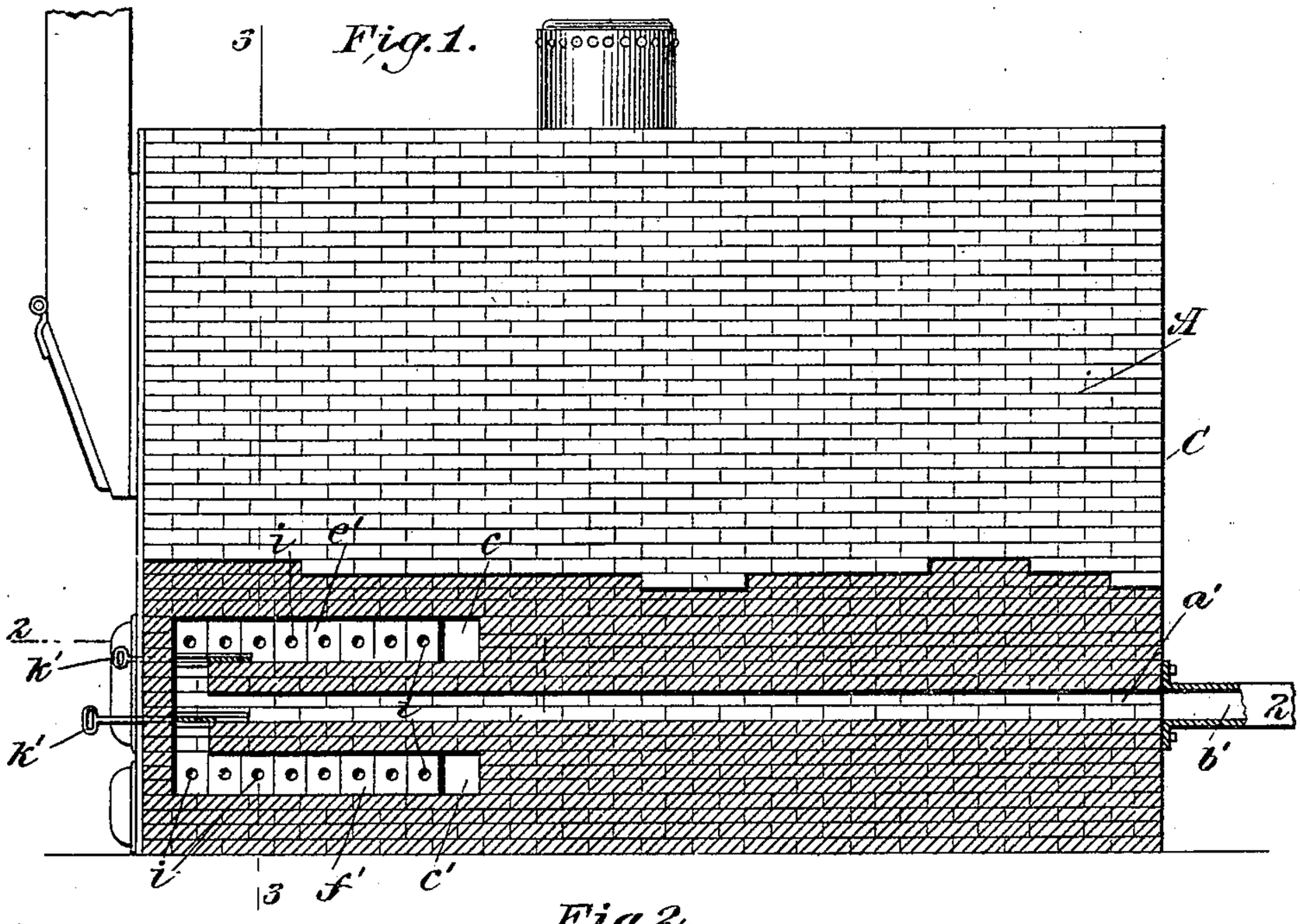


Fig. 2.

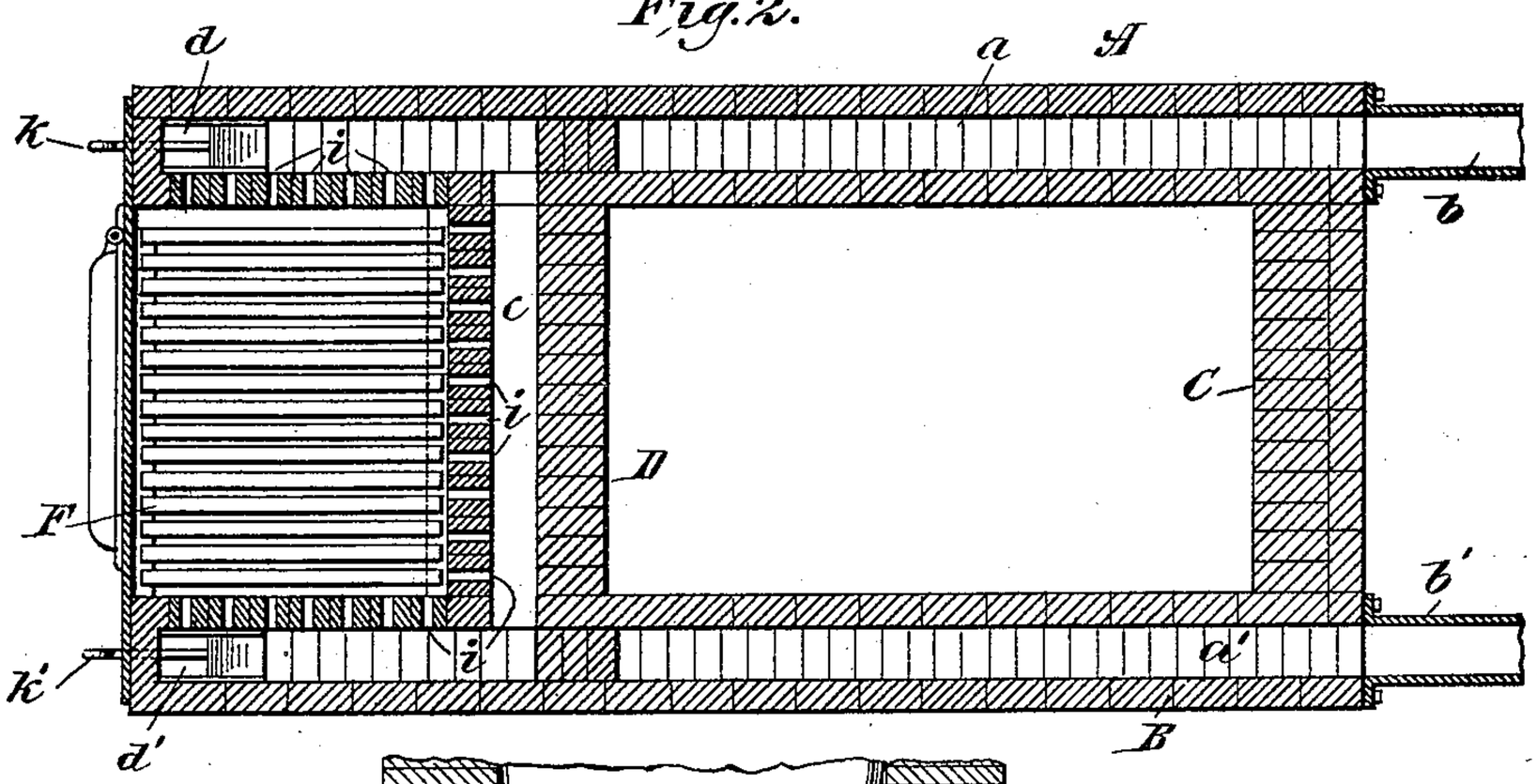
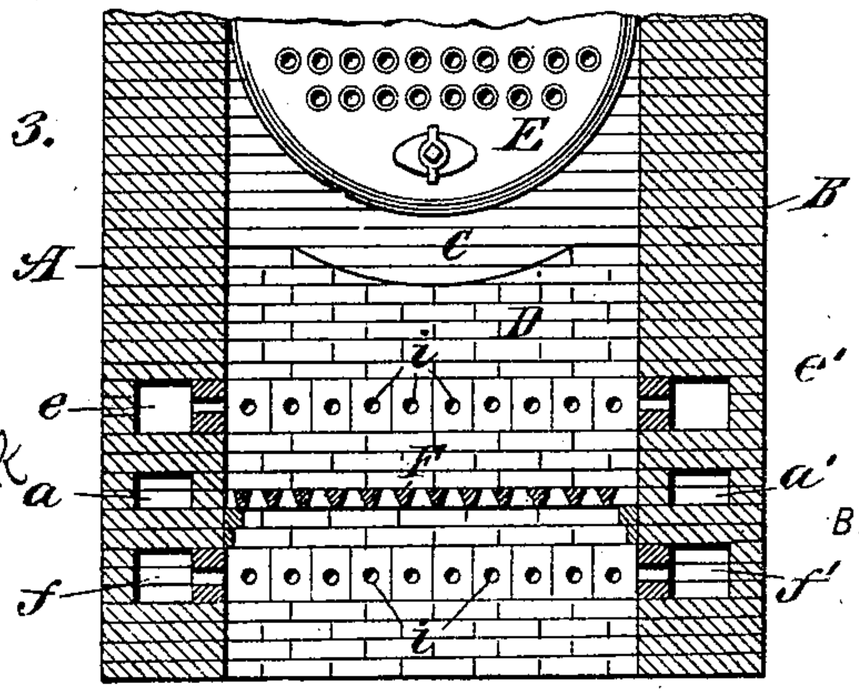


Fig. 3.



WITNESSES:

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 680,521, dated August 13, 1901.

Application filed May 16, 1901. Serial No. 60,491. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSE L. FOY, a citizen of the United States, and a resident of New York, borough of Brooklyn, in the county of Kings and State of New York, have made and invented certain new and useful Improvements in Furnaces, of which the following is a specification.

My invention relates to an improvement in boiler-furnaces, and more particularly to means for supplying air to the fire-bed for the purpose of increasing and perfecting the combustion of the coal and gases. Many devices have been constructed for this purpose, the one most generally used being the steam-jet blower, and while an increased supply of air is afforded thereby, yet it is always open to the objection that by reason of the moisture in the steam the boiler is corroded and injured.

One object of my invention is to supply to the fire an increased supply of heated and dried air, not only under the fire-bed, but also above it, whereby the gases in many cases escaping through the flues will be entirely consumed.

A further object of my invention is to provide means whereby the air may be directed to all parts of the fire-bed—that is, along its sides and at the rear—so that the fire may be kept bright and even, and also to provide means whereby the quantity of air directed to either side or at the rear and also above and below the fire-bed may be nicely regulated; and with these and other ends in view the invention consists in certain novel features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a view in side elevation of a boiler-furnace, a portion of the wall being broken away for the purpose of illustrating the air-flues. Fig. 2 is a sectional view taken on the line 2 2 of Fig. 1, and Fig. 3 a similar view taken on the line 3 3 of Fig. 1.

Referring to the drawings, A B represent the two side walls of the furnace, C the rear wall, and D the transverse or bridge wall, usually constructed of brick and inclosing a boiler E of any desired kind or character, and forward of which is a grate F. In these side walls A B are formed the main flues *a a'*, communicating at their rear ends with the air-pipes *b b'*, connected to a blower. (Not shown.) These air-flues *a a'* extend from the rear to the forward ends of the walls and are preferably formed by properly spacing the bricks of which the walls are constructed, it being evident, however, without further illustration that, if desired, they may be made of pipe or tiling set into the walls.

At the forward end of the wall A and running the length or depth of the grate F are formed the branch flues or air-passages *e f*, the former at a height above the grate and the latter below the grate, the three flues or passages *e*, *a*, and *f* communicating with each other by means of the vertical flue or passage *d*, into which the forward ends of said flues lead. In the opposite side wall B are also formed corresponding flues or passages *e' f'*, which are also of a length equal to the depth of the grate F, the former at a height above the grate and the latter below the grate, the three passages or flues *e' a' f'* communicating at their forward ends by means of the vertical passage *d'*, into which said three passages or flues lead.

In the bridge-wall D is formed a passage *c*, communicating with the rear ends of the flues *e e'*, and also the flue *c'*, communicating with the rear ends of the flues *f f'*, this construction and arrangement resulting in the formation of practically two flues, one above the grate and the other below the grate and extending along one side of the latter, then back of said grate, and then around the opposite side of said grate, which two flues communicate with each other by reason of the said vertical flues and also with the flues *a a'*, which extend the entire length of the two walls A B.

From the passages *e e'*, *f f'*, and *c c'* lead openings *i* into the fire-chamber and ash-pit, or, in other words, at points above and below the grate F, for the purpose of directing the air from said passages above and below the fire-bed, as hereinafter described. In the vertical passage *d* I place sliding dampers *k*, and in the vertical passage *d'* I place the sliding dampers *k' k'*, whereby communication of the branch or short horizontal flues *e e'* and *f f'* may be cut off from the main flues *a a'*.

Having fully described the construction

and arrangement of my new device, I will now describe the operation thereof: Air is forced through the main flues *a a'*, and by reason of its travel along the side walls inclosing the boiler E it is heated and dried. If all the dampers be open, the air passes into the vertical flues *d d'* and then through the branch flues *e e'*, *f f'*, and *c c'* and through the holes or openings *i* above the fire-bed, supplying a sufficient amount of oxygen to cause the gases above the fire-bed to be consumed and also a sufficient amount of air below the fire-bed to materially increase the draft through the same. By locating the passages as above described a current of air is supplied both above and below the fire-bed and at the two sides and rear thereof, the advantage of which will be immediately apparent to those skilled in the art. If it be desired to supply air below the fire-beds only, the upper dampers *k k'* are pulled outwardly, thereby shutting off communication of the branch passages *e e' c* with the main flues *a a'*, thereby directing all the air from said flues *a a'* down into the flues *f f' c'* and from there into the ash-pit under the grate F. If, on the other hand, it becomes necessary to supply the air to and over the fire-bed, the upper dampers are opened and the lower dampers closed, whereby the air from the flues *a a'* is caused to pass into the flues *e e' c* and from there to and over the fire-bed. Again, by closing the dampers on one side and allowing those on the opposite side to remain open the air may be directed largely to one side of the bed and but little to the opposite side, the arrangement of dampers and flues permitting the fire-bed to be kept even and bright by properly adjusting said dampers.

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

In a furnace, the combination with the side walls having horizontal main air-passages formed therein, and extending the length of said walls, and with vertical air-passages at the forward ends of said main passages, and communicating therewith, of a grate located in the forward end of said walls, auxiliary flues located in said side walls above and below said main flues and above and below said grate, the forward ends of said auxiliary flues communicating with said vertical flues or passages, a bridge-wall connecting said side walls, and having flues therein above and below said grate and communicating with the rear ends of said auxiliary flues, and dampers located in said vertical flues whereby any or all of the air passing through the main flues may be directed above or below said grate, substantially as described.

Signed at New York, in the county of New York and State of New York, this 14th day of May, A. D. 1901.

ALPHONSE L. FOY.

Witnesses:

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