No. 731,088. PATENTED JUNE 16, 1903.

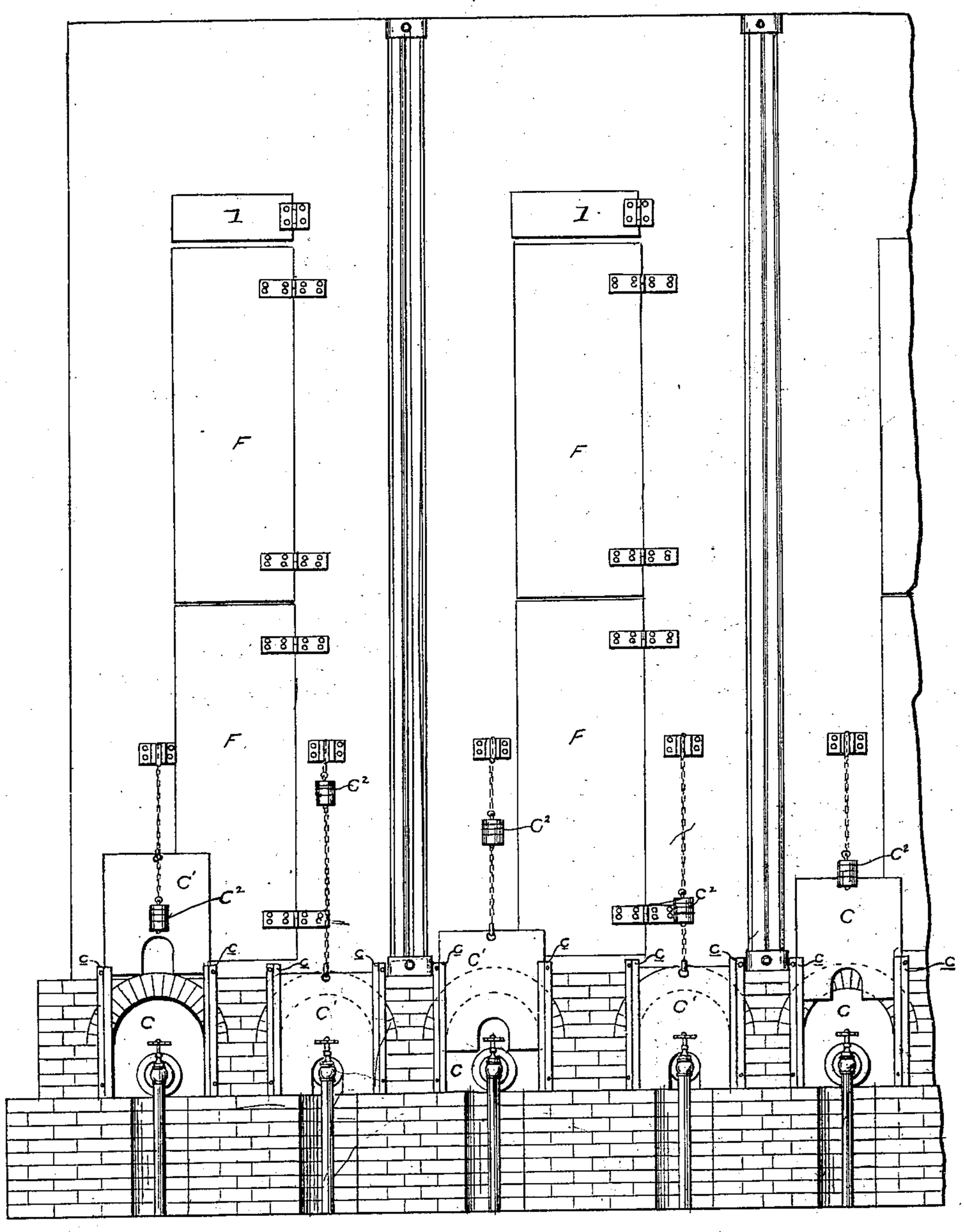
M. UPDIKE.

RETORT COKE OVEN.

APPLICATION FILED OCT. 21, 1901.

NO MODEL. 4 SHEETS—SHEET 1.

FIG. 1.



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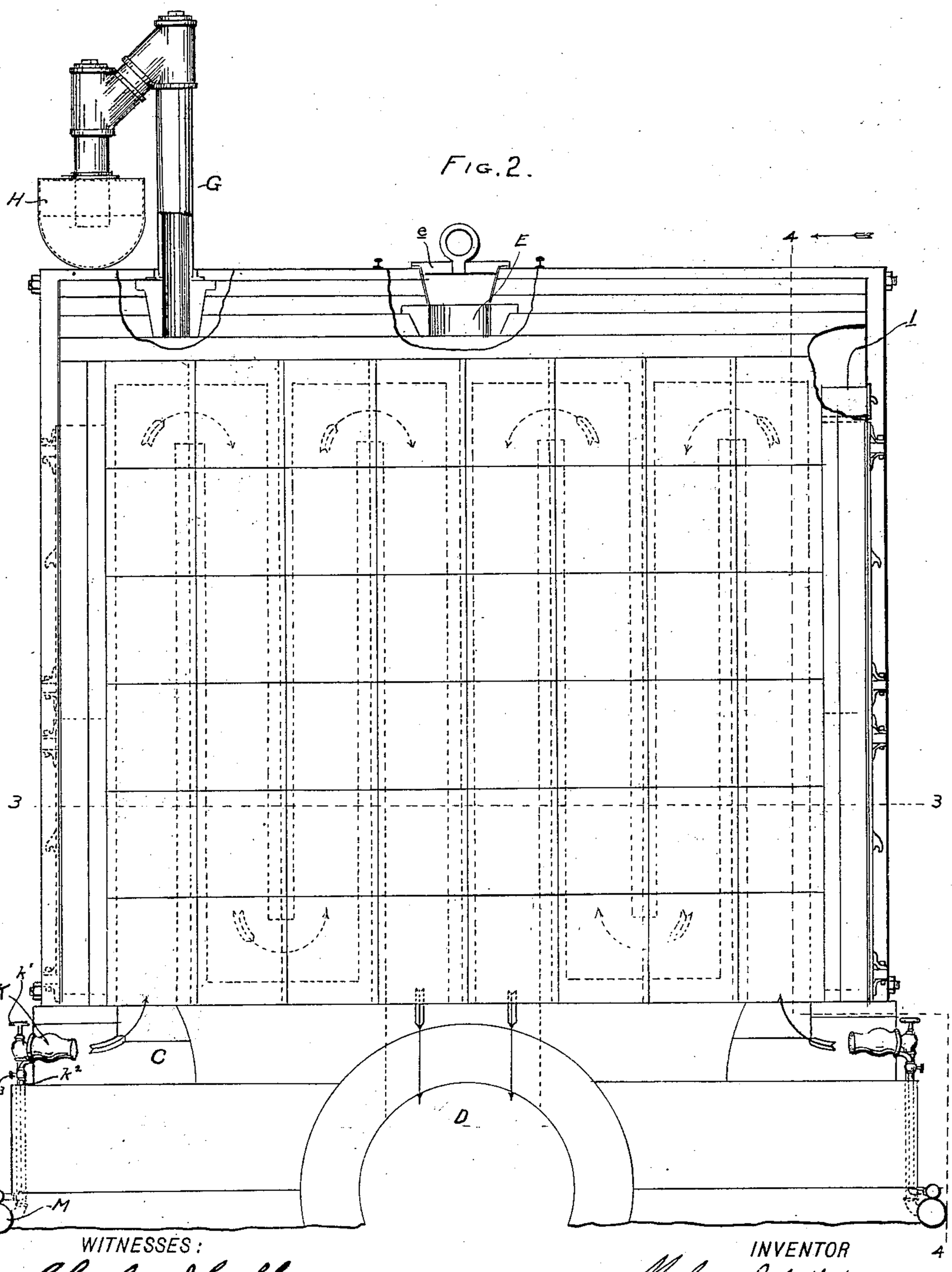
NO MODEL. 4 SHEETS—SHEET 2.

FIG. 2.



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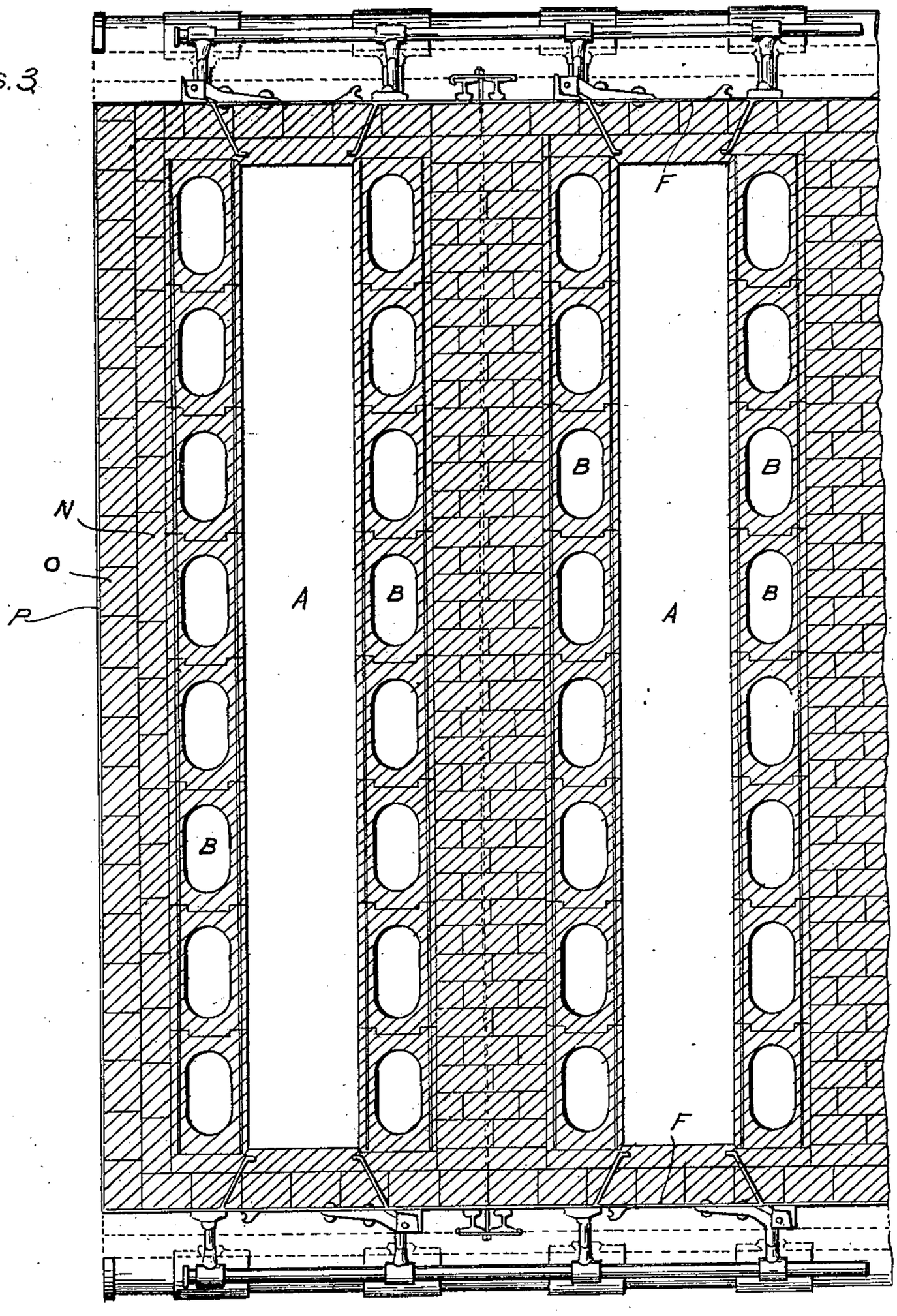
NO MODEL. 4 SHEETS—SHEET 3.

FIG. 3



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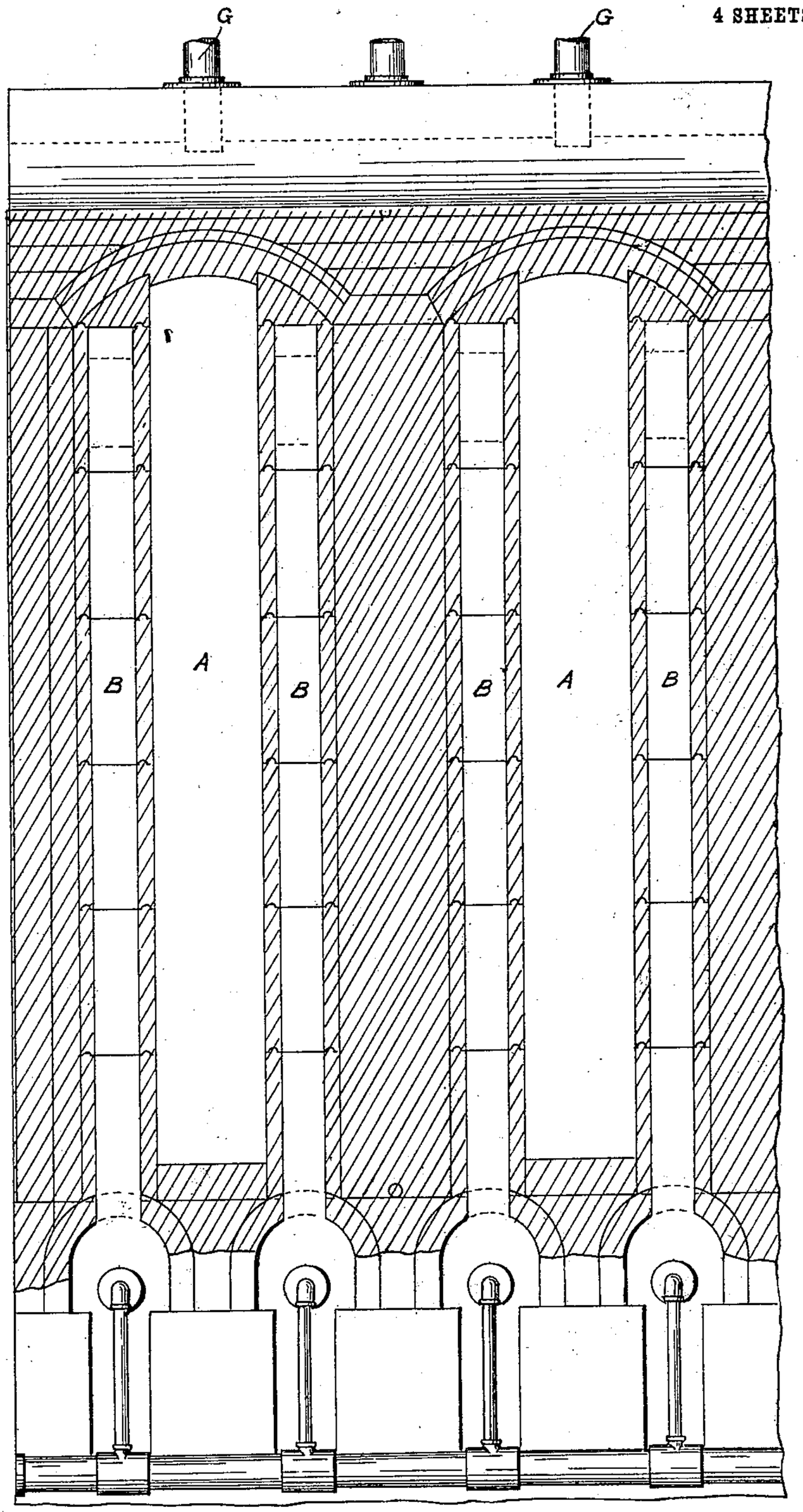
NO MODEL. 4 SHEETS—SHEET 4.

FIG. 4



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No. 731,088. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

MAHLON UPDIKE, OF CHICAGO, ILLINOIS.

RETORT COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 731,088, dated June 16, 1903.

Application filed October 21, 1901. Serial No. 79,355. (No model.)

To all whom it may concern:

Be it known that I, MAHLON UPDIKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Retort Coke-Ovens, of which the following is a description.

My invention belongs to that class of apparatus for the purpose stated in which the coal is charged into a closed retort suitably heated by radiation, the by-products being recovered by means of a hydraulic main and processes well known.

The object is to produce a more simple, efficient, and economical apparatus for the purpose named than is now available.

To this end my invention consists in the novel construction, arrangement, and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference-letters indicate like or corresponding parts, Figure 1 is a front elevation of my improved apparatus. Fig. 2 is an end elevation, parts being shown in dotted lines and others in section. Fig. 3 is a horizontal section on line 3 3 of Fig. 2, and Fig. 4 is a transverse vertical section on line 4 4 of Fig. 2.

In the drawings, A A are retorts inclosed by side walls of sectional flue-tiling B B, arranged to form a serpentine flue extending from the combustion-chamber to the main conduit or flue D, the products of combustion being conducted along the side walls of the retort from top to bottom, as clearly shown in Fig. 2.

E represents apertures for charging the re-retorts, which are discharged through the end doors F in the usual manner.

e is a cover for closing and sealing the charging-aperture E.

G G are pipes for conducting the vapors and gases caused by the distillation of the charge from the retort A to a hydraulic main H or its equivalent, where the by-products are recovered in the usual manner.

I is a door positioned near the top of the retort, by means of which the charge may be suitably leveled.

K is a suitable burner positioned in the combustion-chamber C for heating the retorts. In the preferred form the burner is provided with an air and gas pipe *k*, controlled by a suitable valve *k'*.

k^2 is a steam-pipe controlled by a valve k^3.

L is the steam-main for supplying steam to the burner, and M is the gas-main.

If air is used in place of superheated steam, it is obvious that the necessary changes can be made by those skilled in the art without invention.

The main flue D conducts the products of combustion to a suitable stack, if preferred, first passing the heated gases beneath a suitable boiler or other means for heating water in the general apparatus for generating steam for the purposes of the process.

In the preferred form I use first a layer or backing N, of fire-brick, next the flue-tiling, with a layer O, of suitable insulating material—such, for example, as mineral wool, asbestos, or equivalent material. In practice I have found that the use of mineral wool in the form of briquets is more desirable than in a loose form. For the purpose of sustaining all in the proper position and to prevent injury by the contraction and expansion I inclose the whole with a steel jacket or shell P. This form of construction results in a superior insulation at much less cost and expense and at the same time greatly increases the durability of the structure. The usual thick walls are dispensed with, and the loss by radiation of heat and liability of cracked walls is much less than in the old forms heretofore employed. By the use of flue-tiling also the wall between the flue and the retort is reduced to a minimum and the retort is much more quickly heated than by the usual construction of heavy walls for the flues. The flues being sectional are readily repaired, and their construction and use and the practical results from their use result in a more economical apparatus than has heretofore been employed, which is materially added to by the economy secured in constructing the furnace in the first instance with the novel insulating-walls heretofore set forth.

Each flue B is provided with its own combustion-chamber C, while the main flue D is located below and near the central part of the furnace. By this means I am enabled to construct the flues to extend from each end of

the furnace to the middle, the two ends being duplicates and each connecting with the main flue D. The combustion-chamber C may have its front open, or partially so, for convenience and may be closed by a door C′, which preferably slides in ways *c c* and is counterbalanced by a weight C^2 or equivalent means.

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

1. In an apparatus of the kind described, a closed retort provided with means for conducting the gases and vapors therefrom and means for charging and discharging the same, and having side walls composed of sectional flue-tiling, the openings through which form oppositely-arranged continuous serpentine flues for conducting the products of combustion in close proximity to the retort, a main flue connecting with the inner ends of said flues, and a combustion-chamber connecting with the outer ends of the same, in combination with a burner arranged in said combustion-chamber and constructed to drive the products of combustion into and through said flues.

2. In an apparatus of the kind described a retort provided with means for conducting the gases and vapors therefrom and means for charging and discharging the same, a main flue positioned beneath the retorts for removing the products of combustion, and a combustion-chamber arranged near each end of the retort, a burner arranged in said chamber, and side walls composed of sectional flue-tiling B B forming oppositely-arranged serpentine flues extending from the burner to the main flue.

3. In an apparatus of the kind described, a closed retort provided with means for conducting the gases and vapors therefrom, and means for charging and discharging the same, and having oppositely-arranged serpentine flues in its side walls to heat the same, in combination with a main flue D extending transversely beneath the retort near its middle portion with which the inner ends of the side flues connect, combustion-chambers C at the outer ends of the flues, and means for forcing the products of combustion through said flues, substantially as described.

4. In an apparatus of the kind described, a closed retort provided with means for conducting the gases and vapors therefrom and means for charging and discharging the same, and having oppositely-arranged serpentine flues arranged in its side walls to heat the same, in combination with a main flue D extending transversely beneath the retort near its middle portion with which the inner ends of the side flues connect, combustion-chambers C at the outer end of the flues provided with doors C′ and means for forcing the products of combustion through said flues.

5. In an apparatus of the kind described, a closed retort provided with means for conducting the gases and vapors therefrom and means for charging and discharging the same and having oppositely-arranged serpentine flues arranged in its side walls to heat the same, said flues extending from each end of the retort to a main flue D extending transversely beneath the retort near its middle portion, and each connecting at its outer end with the combustion-chamber C, and means for forcing the products of combustion through said flues.

6. In an apparatus of the kind described, a retort having hollow side walls forming serpentine flues, said flues being oppositely arranged and communicating at one end with a main flue common to both of said flues, and a combustion-chamber associated with the opposite end thereof; substantially as described.

MAHLON UPDIKE.

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