

No. 622,219.

Patented Apr. 4, 1899.

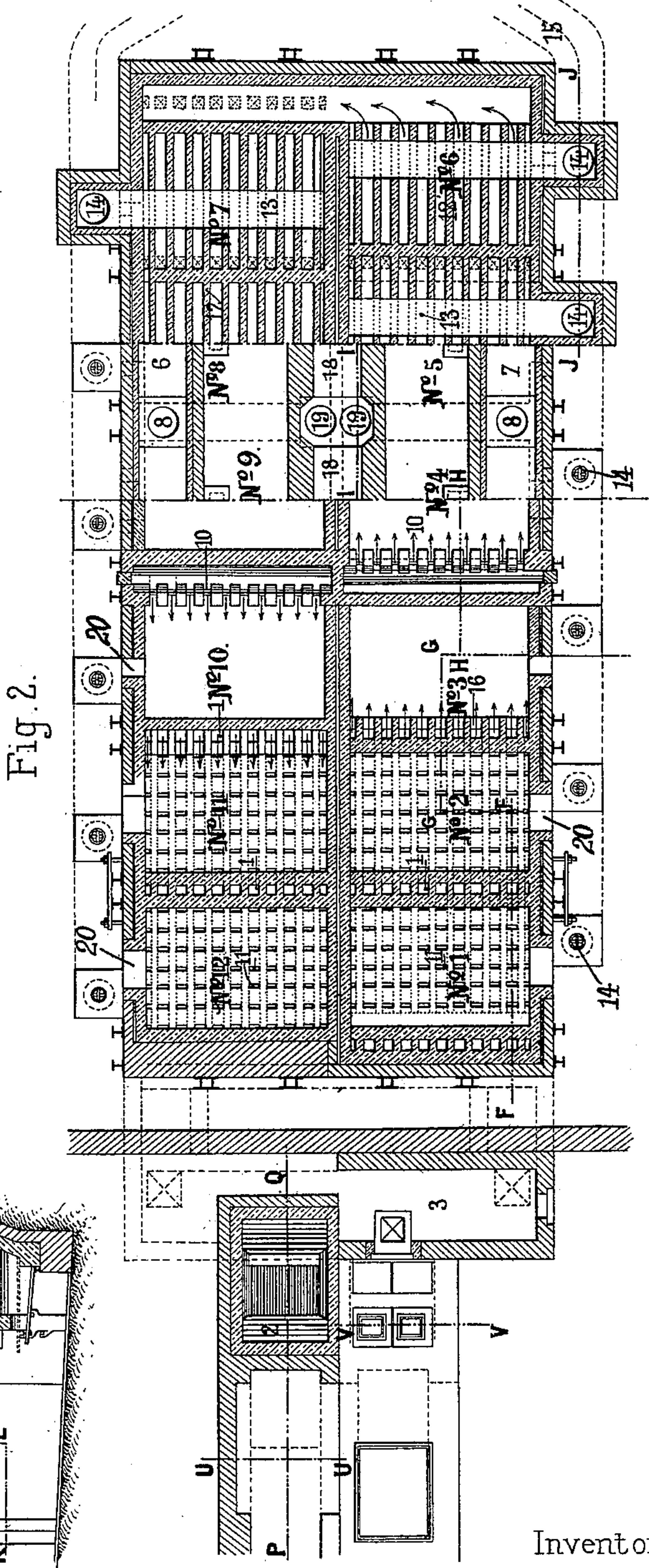
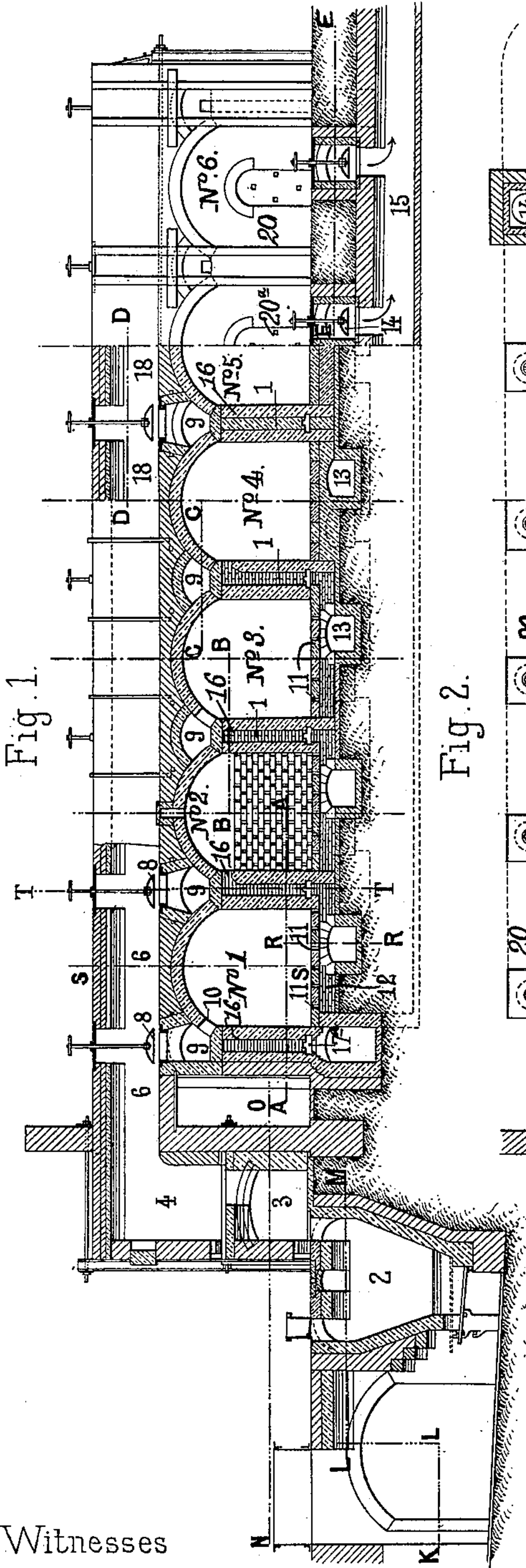
E. GOBBE.

CONTINUOUS KILN FOR BAKING POTTERY OR BURNING CEMENT.

(Application filed Dec. 23, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

J. B. Keeler
R. D. Johnston, Jr.

Inventor

By *E. G. Gobbé*
James L. Norris
Att'y

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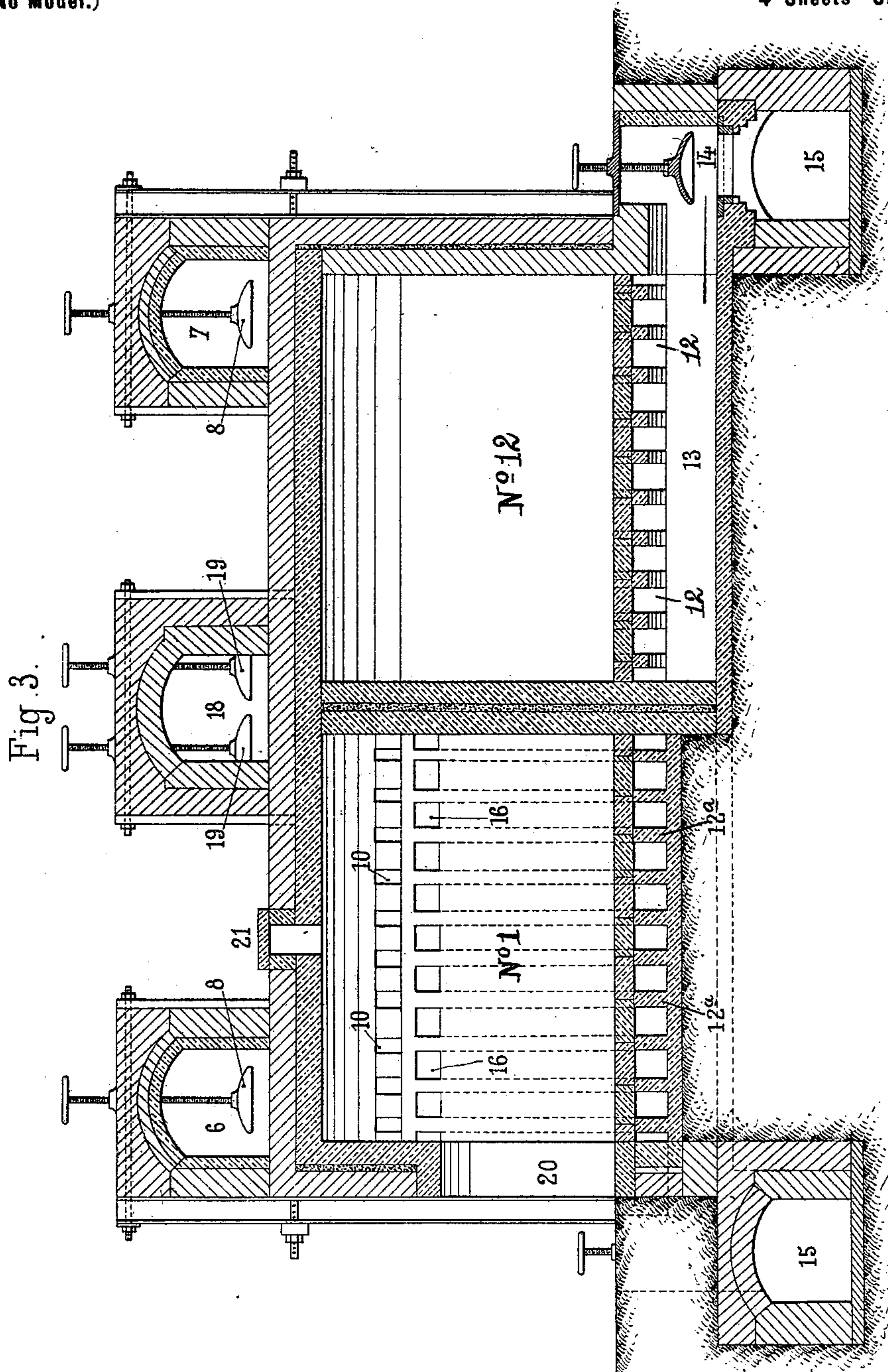
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4 Sheets—Sheet 2.



Witnesses

J. B. Keeler
R. D. Johnston, Jr.

Inventor

By *Emile Gobbe*
James L. Norris
Attorney

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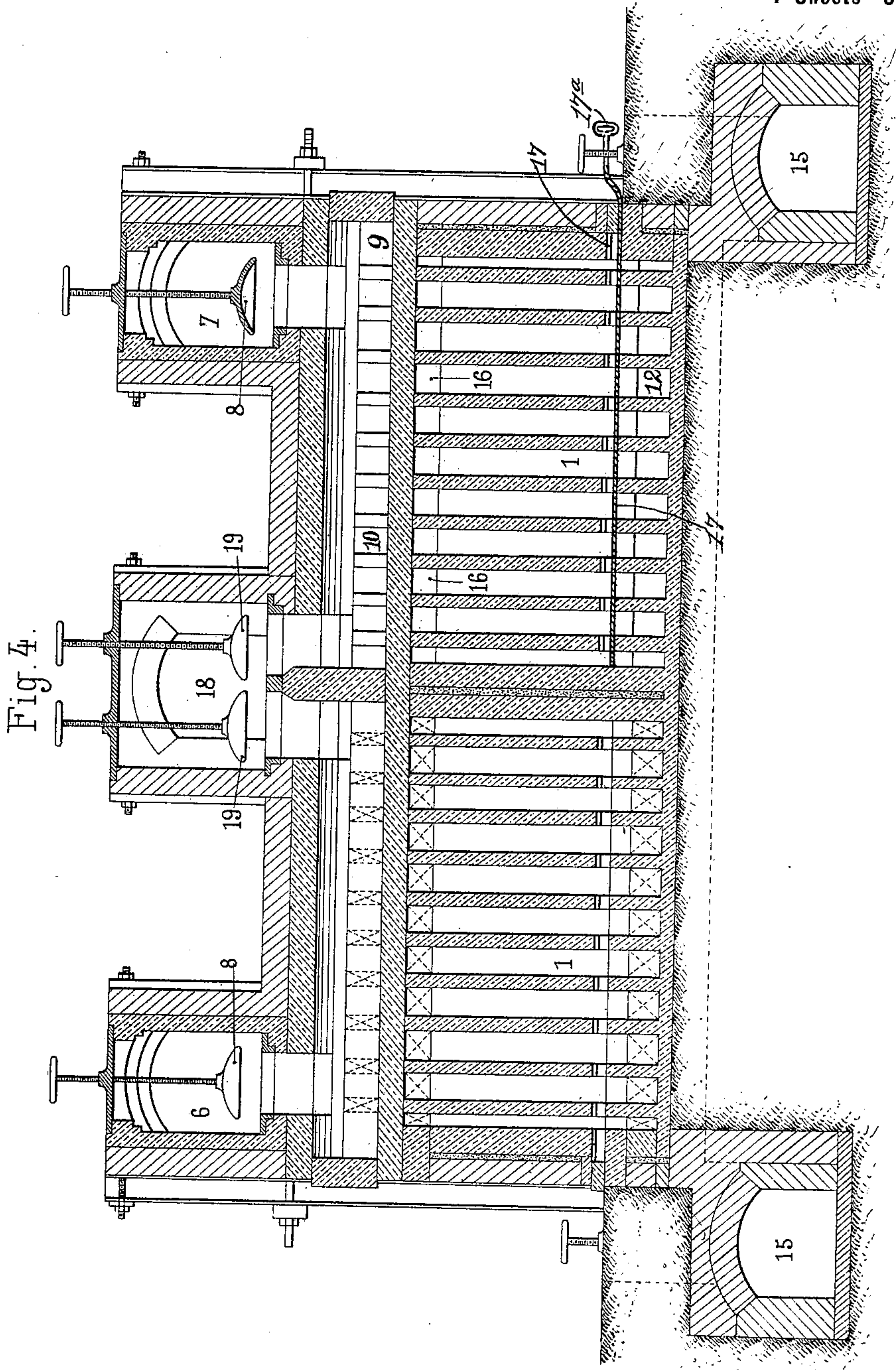
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4 Sheets—Sheet 3.



Witnesses

J. B. Keefe
R. D. Johnston Jr.

Inventor

Emile Gobbe
By James L. Norris
Att'y

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E. GOBBE.

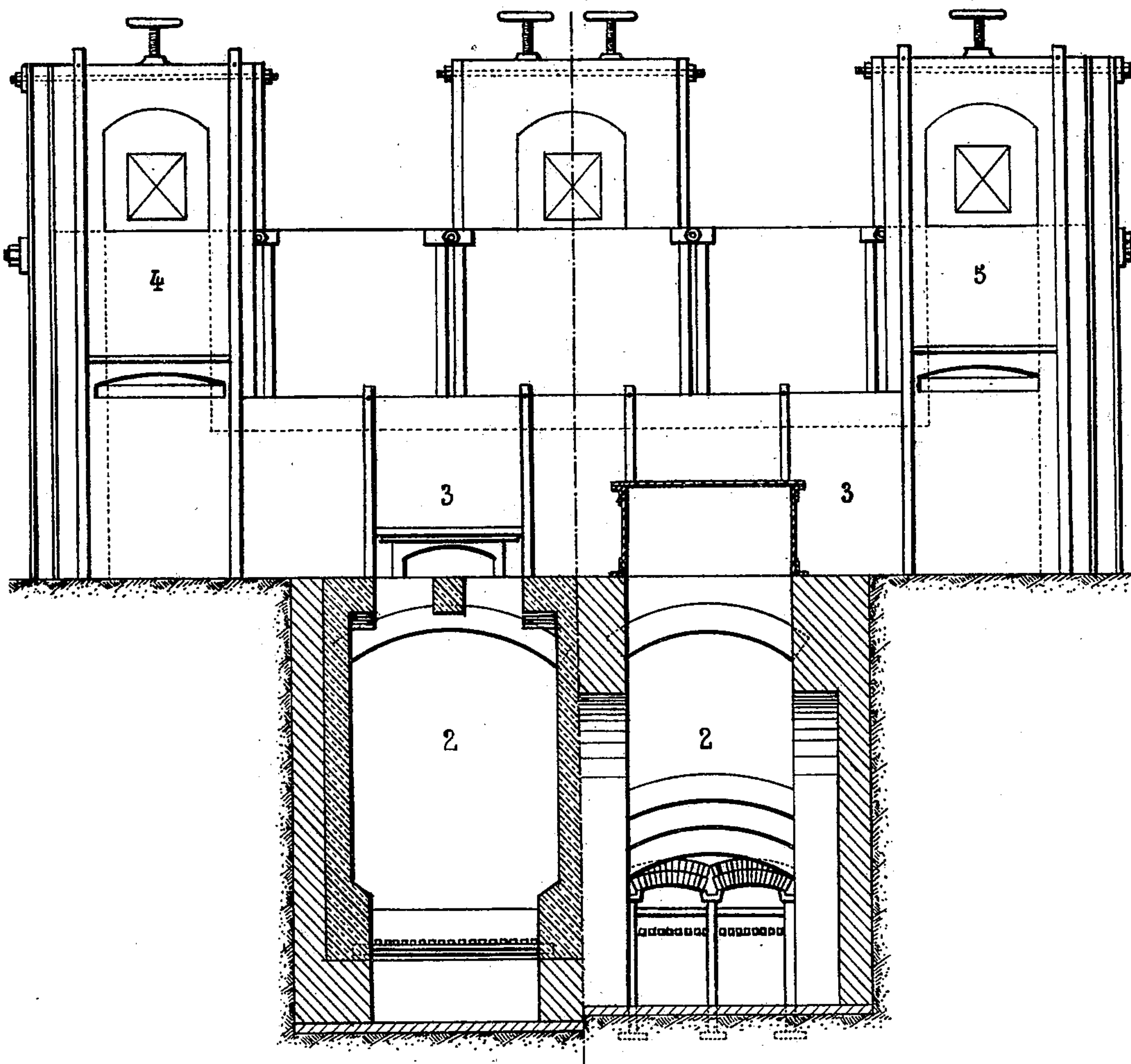
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4 Sheets—Sheet 4.

Fig. 5.



Witnesses

Robert G. Smith
J. B. Keefe

Inventor

Emile Gobbe

By

James L. Norris
Att'y

UNITED STATES PATENT OFFICE.

EMILE GOBBE, OF JUMET, BELGIUM.

CONTINUOUS KILN FOR BAKING POTTERY OR BURNING CEMENT.

SPECIFICATION forming part of Letters Patent No. 622,219, dated April 4, 1899.

Application filed December 23, 1897, Serial No. 663,220. (No model.)

To all whom it may concern:

Be it known that I, EMILE GOBBE, a subject of His Majesty the King of Belgium, residing at Jumet, Belgium, have invented certain new and useful Improvements in Continuous Kilns for Baking Pottery or Burning Cement, of which the following is a specification.

My invention relates to kilns for baking pottery or burning cement, my purpose being to provide a continuous kiln in which the several steps of the process can be carried on in sequence from one chamber to another with an economy of time and labor.

It is my aim also to provide a construction by which perfect combustion may be obtained in the baking-chambers without admitting an injurious excess of cold air and without bringing solid fuel into contact with the articles stacked in the kiln-chambers, which is liable to cause adhesion of ashes and partly-consumed fuel to such articles.

I aim also to provide means whereby a high temperature can be obtained with a marked economy in the expenditure of fuel and to provide a continuous kiln having a double series of chambers which may be brought into communication either in series or in parallel, or, in other words, from one chamber to another in the same series, or from a chamber in one series to another chamber in the adjacent series, any one or more of said chambers being capable of isolation from all the rest or of being placed in communication with any one or more of the other chambers.

To explain my said invention, reference will be had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a kiln construed in accordance with my invention, the section being taken along the lines P Q, F F, G G, H H, I I, and J J, Fig. 2. Fig. 2 is a horizontal section of the same upon the lines N O, K L, I M, A A, B B, C C, D D, and E E of Fig. 1. Fig. 3 is a transverse vertical section of the kiln upon the line R R S S of Fig. 1. Fig. 4 is a similar section on the line T T in Fig. 2. Fig. 5 is a transverse section on the lines U U V V in Fig. 2.

The kiln consists of a battery of any number of chambers—for example, twelve—ar-

ranged in two parallel series, with six chambers in each. I have designated these chambers by marking them successively No. 1, No. 2, &c., up to and including No. 6 in the first series and from Nos. 7 to 12 in the adjacent series, No. 7 being adjacent to No. 6, No. 8 to No. 5, &c., up to the last chamber No. 12, which is opposite No. 1. The chambers in the same series, or Nos. 1 to 6, communicate with one another through flues 1, formed in the walls separating them, each set of these flues having openings 16 into the upper portion of the next succeeding chamber, as seen in Figs. 1 and 3. The flues 1 have communication through openings 11 in the floor of each chamber with subways 12 beneath the floor, the latter being supported upon parallel walls 12^a, which inclose said subways, these being shown most clearly in Figs. 2 and 3, so that the heated air and products of combustion from the bottom of each chamber can pass to the top of the adjoining chamber.

Combustible gas is generated in gas-producers 2 of any suitable type, from which it flows into collectors 3 and then to vertical columns 4 and 5, one for each series of kiln-chambers. The gas-producers are practically shown by a conventional illustration only, as their form is so well understood as to require no special explanation. The vertical columns 4 and 5 communicate with horizontal passages 6 and 7, respectively, Figs. 1 and 3. The passage 6 communicates with the chambers Nos. 1 to 6 through transverse gas-conduits 9, which have openings 10 into the upper part of each chamber. The admission of gas into any one or more of the chambers may be prevented by closing dampers 8 in the horizontal passages 6 and 7. Any two of the chambers in the two adjacent series may be thrown into or cut off from communication by dampers 19, arranged in a hot-air-collecting conduit 18, which runs centrally the whole length of the kiln and has communication with the flues 9 on opposite sides of the dividing longitudinal wall. Transverse channels 17 are formed beneath the lower ends of the flues 1 and provided with long iron dampers 17^a, capable of sliding, so as to open or close said flues, thereby cutting any one of the chambers off from the succeeding cham-

ber in the same series. It will be noted in Fig. 1 that the course of the products of combustion and heated air is downward through the floor-openings 11 into the passages 12, thence into flues 1, and through openings 16 into the top of the next chamber, this course being repeated throughout, provided the dampers 17^a are all opened. If the latter are closed, one or more, the passages 12 have connection with transverse culverts 13, which communicate with longitudinal fume-collecting conduits 15 through openings that can be closed by dampers 14.

As the products of combustion are generally charged with more or less watery vapor, which, if condensed upon the cold and moist articles stacked in the chambers, might soften them so greatly that they would fail to retain their form, it is desirable that a proper quantity of air, heated by its passage between the baked articles in other chambers, be first admitted to the chamber or chambers that have been charged last. To make the economical operation clearly understood and to follow the order of procedure, I will here describe the several steps in their order.

Let it be supposed that the chamber designated No. 10 has been discharged or emptied of its contents, while the preceding chamber No. 9 has a charge. To separate these two chambers from the others, the long iron damper 17^a beneath the wall which separates chamber No. 8 from No. 9 is closed, the remaining dampers of the same kind being left open. The fume-damper 14, which connects the culvert 13 beneath chamber No. 8 with the fume-collector 15, is also closed, the other dampers 14 being left open. The gas-damper 8, which admits gas to chamber No. 4 on the opposite side of the wall from No. 9, is opened, the other dampers 8 being closed, as it is desirable to concentrate the temperature for baking the articles in chamber No. 4 at this stage. Finally the dampers 19, which give communication to chambers Nos. 12 and 8, are left open, the others being closed. The cold air from the exterior now enters chamber No. 10, which is empty, through an opening 20, which is closed by a door 20^a (see Fig. 1) when the chamber has a charge, and, passing down through openings 11 in the floor, enters the flues 1 and passes into the top of chamber No. 11, which is filled with baked articles. By flowing through the spaces between these articles the air acquires a certain degree of heat, and thence it passes to chamber No. 12, where it divides into two parts or volumes. One part passes through the openings 10 into the flue 9 and thence through the open damper 19, which communicates with the chamber No. 12, thereby reaching the hot-air collector 18, from which it passes to the chamber No. 8 by way of the open damper 19, the flue 9, and passages 10. Thus this part of the heated air flows from the top of chamber No. 8 to the bottom and thence through the floor-openings 11 into the sub-

ways 12, culvert 13, and through the fume-damper 14 into the fume-collector 15. The remaining portion of the heated air passes from the upper part of chamber No. 12 to the bottom, then through the floor-openings 11, and thence over to chambers Nos. 1, 2, and 3 in succession, passing between the baked articles in each and constantly acquiring a higher degree of heat. Finally it reaches the openings 16 in chamber No. 4, where it aids in supporting combustion of the gas, and being itself of a high degree of heat the necessary temperature is speedily obtained, and the articles in said chamber are properly baked. The gas from the generators 2 passes, in order to reach the openings 10 of the chamber No. 4, through the receptacle 3, vertical column 4, and conduit 6 to the damper 8, and thence into the flue 9 of the said chamber. The mixture of gas and heated air takes place for the most part in the space between the articles stacked in the chamber. The combustion thus is equalized, or nearly so, in every part, and the products thereof pass off into chambers Nos. 5, 6, and 7, and finally reach the chimney through the damper 14 of the latter chamber and the fume-collector 15. The baking process requires from eight to twenty-four hours, according to the dimensions of the articles subjected to said process. During this time the adjustment of the dampers remains as already described, only such changes being made by regulating the area of the dampered openings as may be called for by the variations in temperature in the kiln. When the process in chamber No. 4 is complete, the flames are admitted to the succeeding chamber No. 5, as follows: The gas-damper 8 of said chamber is opened and the corresponding damper of chamber No. 4 is closed. The damper 17^a between the chambers Nos. 8 and 9 is opened and the same damper in the passage 17 between the chambers Nos. 9 and 10 is closed. The damper 14 of chamber No. 9 is opened and the corresponding damper of chamber No. 7 is closed. Finally the dampers 19 of chambers Nos. 9 and 1 are opened and those of chambers Nos. 8 and 12 are closed.

By suitable adjustments of the several dampers in a manner which will be readily understood from the foregoing explanation the process of drying by hot air may be carried on in one or more chambers and baking in others, while still others can be emptied or charged at the same time. As soon as the baking process is completed at one point it can be carried to the next, so that the kiln may be kept in continuous operation. Moreover, by utilizing the baked contents to heat the air used in drying the articles as soon as they are stacked the process is expedited and economized.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A continuous kiln for pottery having a

double series of chambers separated by a dividing longitudinal wall, transverse walls separating the individual chambers and provided with vertical flues, their lower ends communicating with subways beneath the floors and openings in said floors and their upper ends with the upper portions of the chambers, a central longitudinal passage communicating with both series of chambers through gas-flues over the transverse walls, which open into said chambers immediately above the openings from the vertical flues, independent dampers to close the communication between said central passage and any one or more of said chambers, gas-conduits one for each series of chambers opening into the outer ends of the gas-flues each opening having an independent damper, and culverts beneath each chamber-floor communicating with the subways and with longitudinal fume-collectors through openings having dampers, substantially as described.

2. A continuous kiln for pottery and other purposes, comprising two parallel series of chambers, a central longitudinal hot-air collector, or passage, over the wall dividing the two series, transverse flues over the walls separating the chambers in each series, each flue having a series of openings into the top of a chamber, and opening at one end into a dampered passage to the central hot-air collector and at its other end into a dampered passage to a gas-conduit, gas producers or generators arranged at one end of the kiln and opening into gas-receptacles, vertical columns to conduct the gas from said receptacles to the gas-conduits, transverse culverts beneath the floors of the chambers communicating with the latter through subways and openings in the floors of the chambers, and flues in the transverse walls between the chambers, their lower ends communicating with the subways beneath the chamber preceding the one into which the transverse flues open, and the up-

per ends opening into the same chamber as said transverse flues and just beneath the latter, and fume-collectors having dampered passages to the transverse culverts, substantially as described.

3. A kiln for baking pottery, comprising a battery of chambers arranged in two parallel series separated by a central longitudinal wall, transverse walls on both sides the latter between the individual chambers, gas-generators at one end of the kiln communicating through receivers with vertical columns one for each series of chambers, a gas-flue for each chamber arranged above the transverse wall and having openings into the upper part of the chamber, a gas-conduit extending longitudinally along the tops of the chambers in each series and having openings with independent dampers into the gas-flues, a series of vertical flues in each transverse wall opening into the top of the adjacent chamber immediately beneath the openings from the gas-flues, a series of subways beneath the floor of each chamber communicating with the lower ends of the vertical flues and with the chamber by openings in said floor, a long damper to close the lower ends of the vertical flues, a central hot-air collector, or passage, over the wall between the two series of chambers and having openings controlled by dampers into the adjacent ends of the gas-flues and transverse culverts beneath the floors of the chambers in each series and communicating with the subways and at their outer ends with fume-collectors through openings having independent dampers, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EM. GOBBE.

Witnesses:

HIPPOLYLE FOTTE,
O. M. SPRIARD.