

D. R. RUSSELL.
RETORT BENCH.

APPLICATION FILED NOV. 16, 1908.

930,494.

Patented Aug. 10, 1909.

4 SHEETS—SHEET 1.

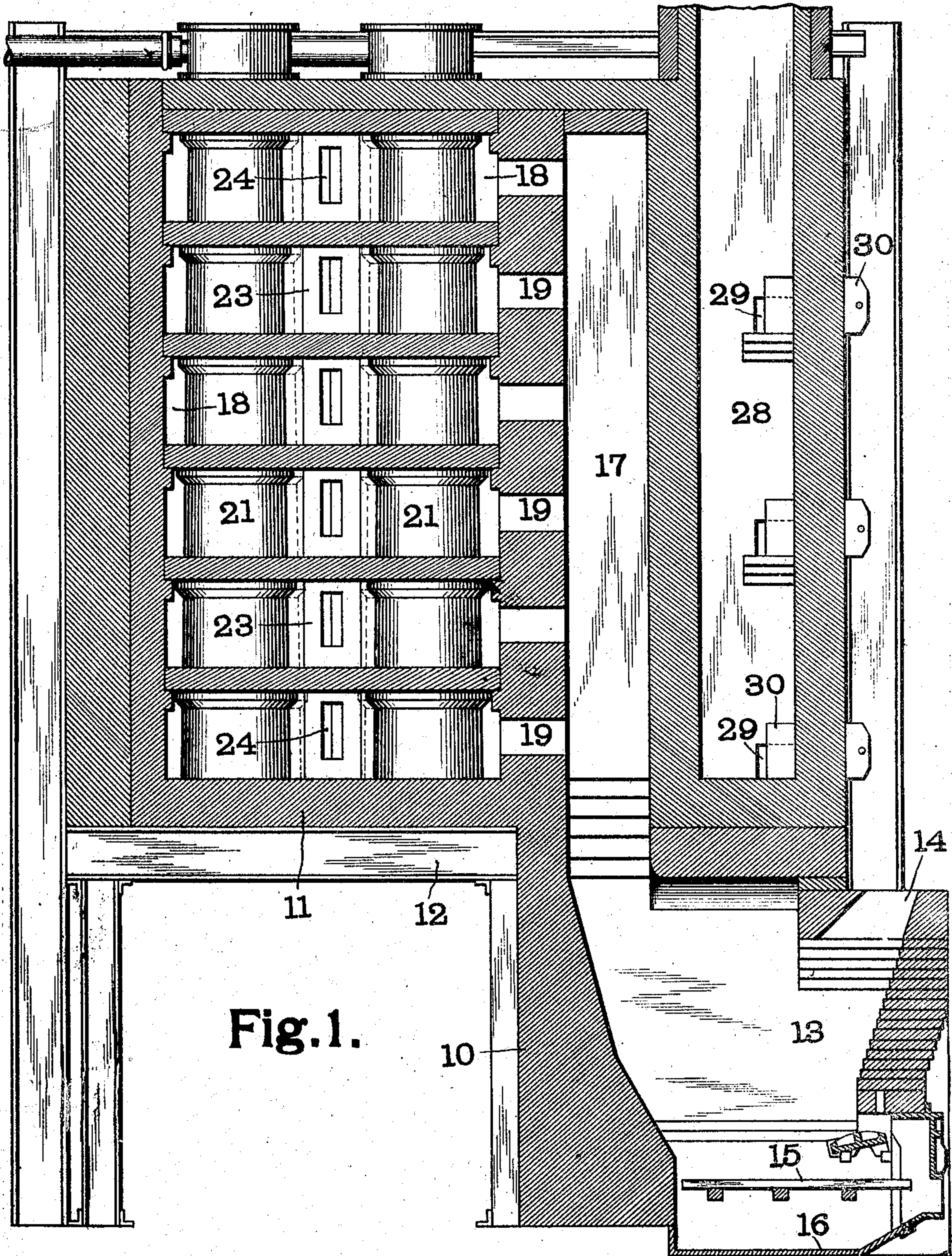


Fig. 1.

Witnesses

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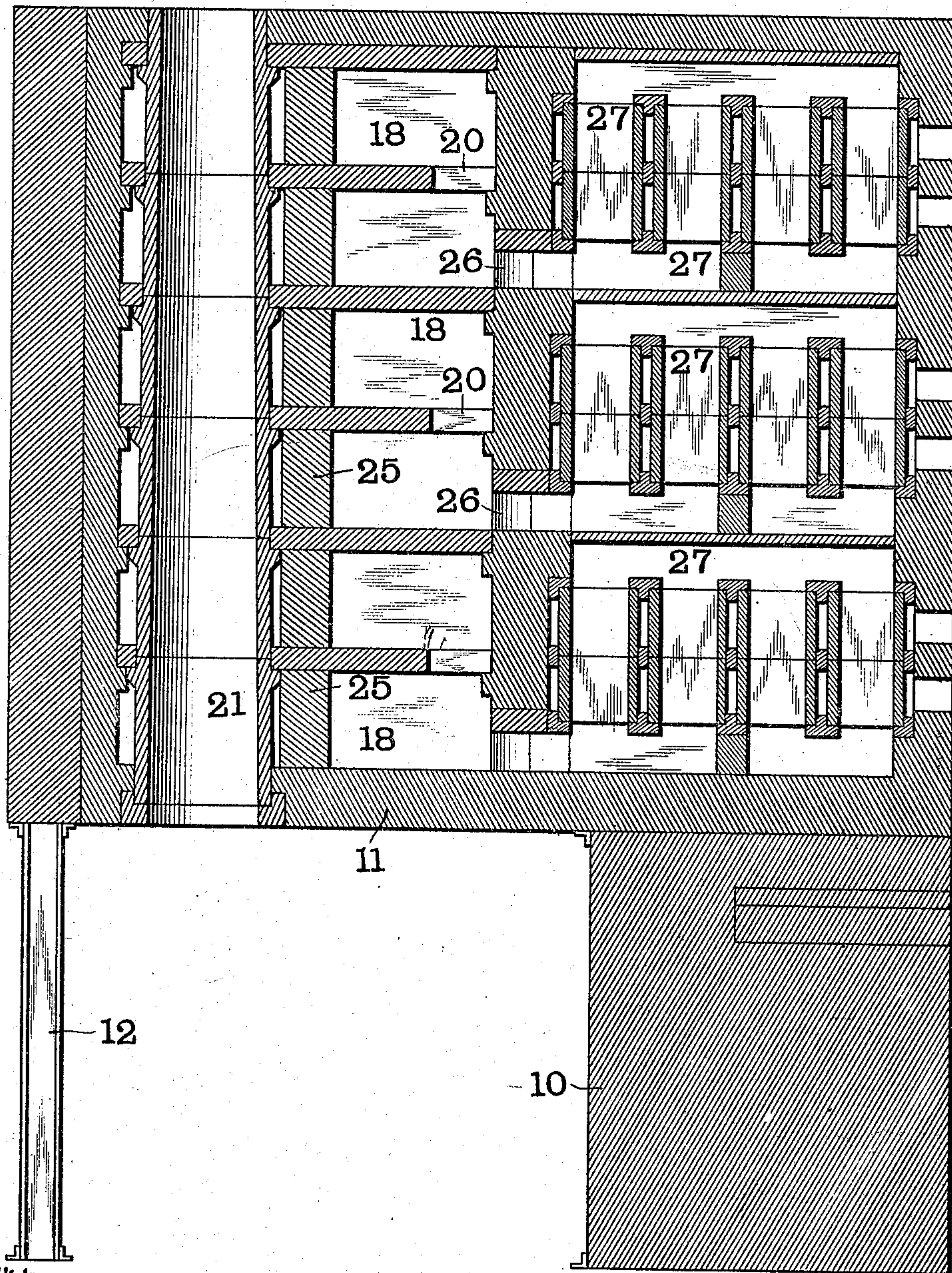
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4 SHEETS—SHEET 2.

Fig. 2.



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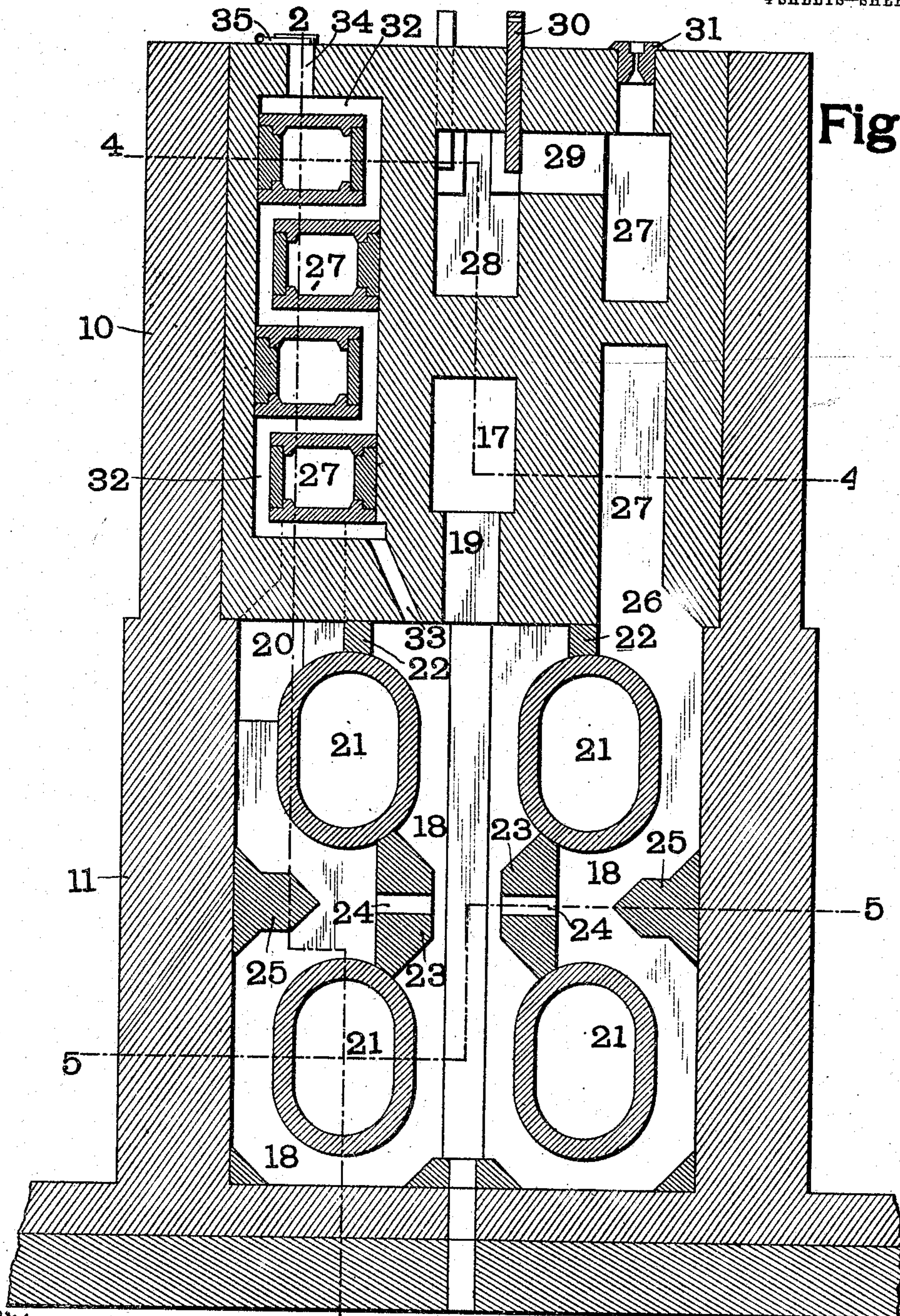


Fig. 3.

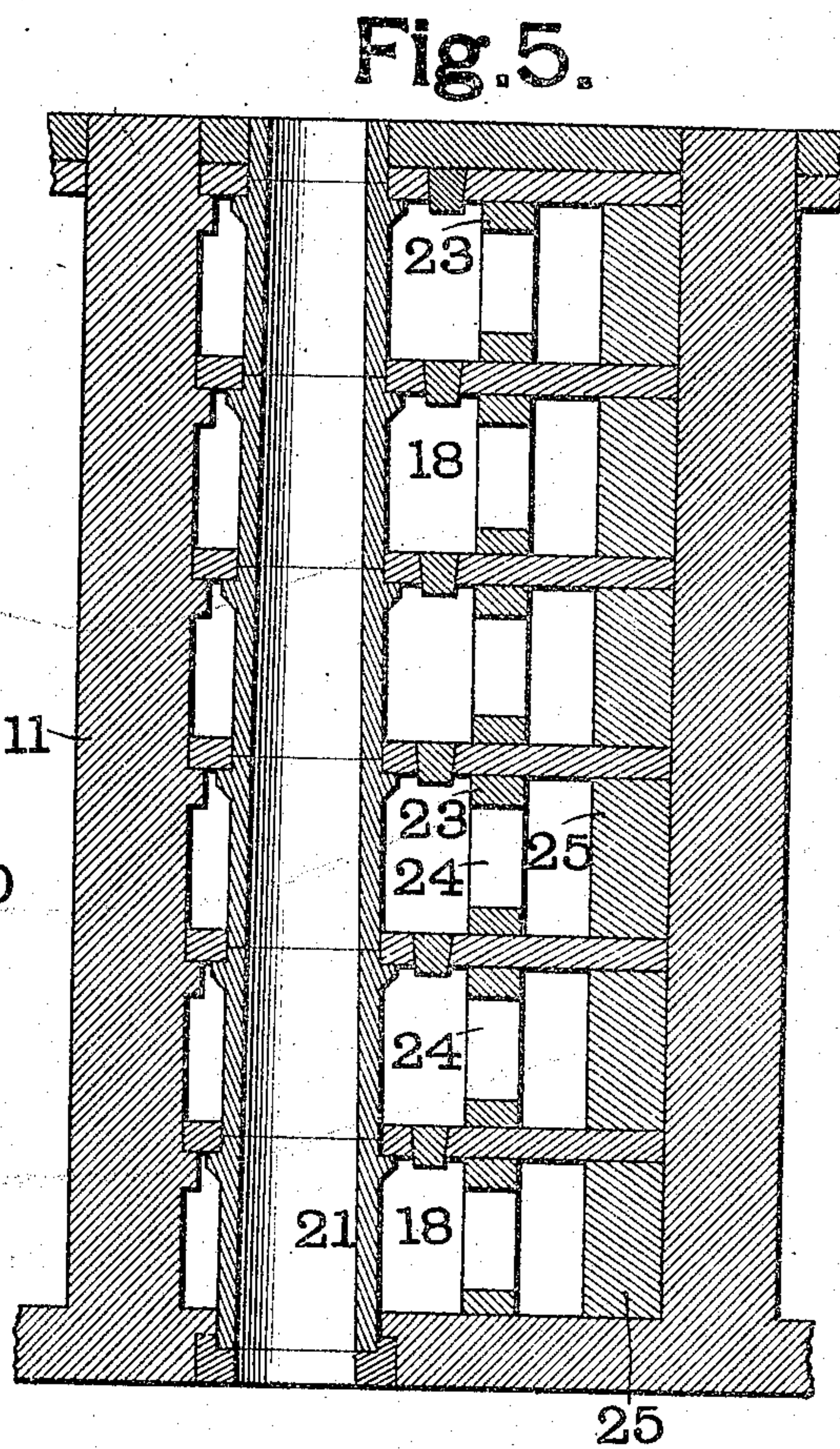
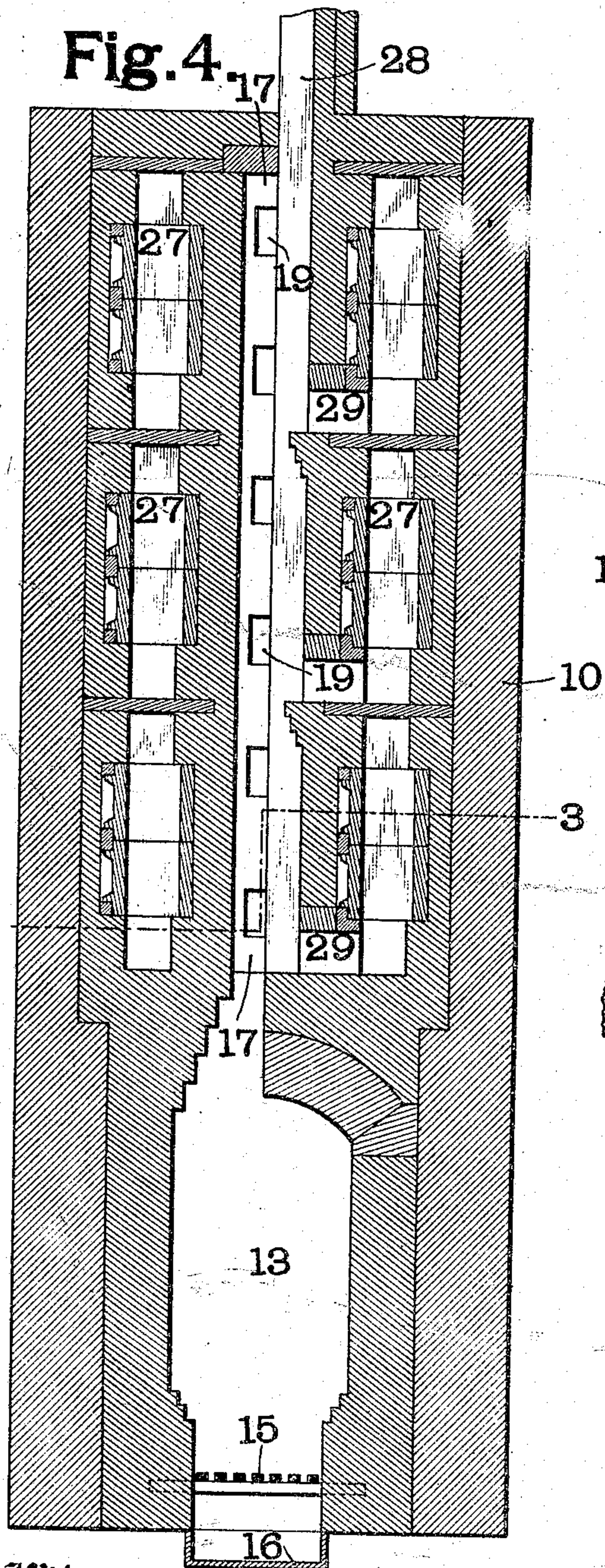
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

DANIEL R. RUSSELL, OF ST. LOUIS, MISSOURI.

RETORT-BENCH.

No. 930,454.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed November 16, 1908. Serial No. 462,345.

To all whom it may concern:

Be it known that I, DANIEL R. RUSSELL, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a certain new and useful Retort-Bench, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to retort benches, and more particularly to that class of retort benches which are provided with vertical retorts.

The object of my invention is to provide improved and simplified means by which the heating of the various parts of the retorts can be independently regulated so that the highest temperature may be had at the center or at either end of the retort.

In the accompanying drawings, which illustrate one form of retort bench made in accordance with my invention, Figure 1 is a vertical central section, Fig. 2 is a vertical section on the line 2—2 of Fig. 3, Fig. 3 is a horizontal section on the line 3—3 of Fig. 4 and Figs. 4 and 5 are vertical cross-sections on the lines 4—4 and 5—5 respectively of Fig. 3.

Like marks of reference refer to similar parts in the several views of the drawings.

The retort bench consists of a front portion 10 and a rear portion 11, the rear portion being supported by frame-work 12. Formed in the lower part of the front portion 10 is a furnace 13 for generating furnace gas. This furnace 13 is provided with the usual flue 14, grate 15 and ash pan 16. Communicating with the furnace 13 is a flue 17 for conducting the furnace gases to the various heating or combustion chambers 18. The flue 17 communicates with the heating or combustion chambers 18 by means of the passages 19, as best shown in Figs. 1 and 3. The heating chambers 18 are six in number and are formed in pairs by means of passages 20, as best shown in Fig. 2. Each pair of chambers thus constitutes a set which are connected together but which are entirely independent of the other sets. Passing through the various chambers 18 are ver-

tical retorts 21 which, in the form of furnace shown in the drawings, are four in number.

In order to insure the circulation of the heated gases around the retorts 21 each of the chambers 18 is provided with a pair of short baffle walls 22 connecting the front pair of retorts with the front portion 11 of the furnace, a pair of baffle walls 23 connecting the front and rear retorts and provided with passages 24, and also with a pair of inwardly projecting baffle walls 25. While each set of combustion chambers is thus provided with two gas inlets, but a single outlet is provided for the gases from the two chambers constituting a set. This outlet 26 communicates with a set of recuperator flues 27, as best shown in Fig. 2. The sets of recuperator flues are, therefore, three in number, one for each set of heating chambers. The gases, after passing through the recuperator flues 27 enter the chimney 28 through a passage 29. Each of the passages 29 is provided with a valve or damper 30 by means of which the passage of the gases to the chimney is regulated, thus indirectly regulating the passage of gases from the flue 17 to the two corresponding heating chambers. The recuperator flues 27 may be provided with the usual stoppers 31 for giving access thereto.

In order to supply heated secondary air to the various combustion chambers, each of the sets of recuperator flues 27 is provided with a pair of sinuous passages 32 communicating at one end through a passage 33 with one of the combustion chambers and at the other through a passage 34 with the atmosphere. The passage 34 is controlled by means of a damper 35 so that the supply of secondary air may be regulated to correspond with the amount of gases entering the heating chamber.

In the operation of my retort bench, the retorts are first charged in the usual manner and the furnace 13 supplied with fuel. The heated gases from the furnace 13 pass up through the flue 17 and into the various heating chambers 18 through the passages 19. The amount of gases entering each set of heating chambers, however, can be independently regulated by means of the valves or chambers 30 as the gases will not enter

the heating or combustion chambers unless a corresponding amount of the products of combustion can escape through the openings 29 into the chimney 28. At the same time a
 5 supply of secondary air to each of the combustion chambers can be independently regulated by means of the dampers 35. In this way perfect control is obtained of the heating of the retorts throughout their entire
 10 length and at the same time the construction is simple and not liable to get out of order.

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

15 1. The combination with a retort bench, of a vertical retort in said bench, said bench being provided with a plurality of heating chambers surrounding said retort, said chambers being arranged in sets separated from
 20 each other but having the chambers of each set connected, air and gas inlets for each chamber and a common outlet for the chambers of each set.

2. The combination with a retort bench, 25 of a vertical retort in said bench, said bench being provided with a plurality of heating chambers surrounding said retort, said chambers being arranged in sets separated from each other but having the chambers of each
 30 set connected, air and gas inlets for each chamber, a common outlet for the chambers of each set, and means for independently regulating each set of chambers.

3. The combination with a retort bench, 35 of a vertical retort in said bench, said bench being provided with a plurality of heating chambers surrounding said retort, said chambers being arranged in sets separated from each other but having the chambers of each
 40 set connected, air and gas inlets for each chamber, a common outlet for the chambers of each set, and a valve in each of said outlets for independently regulating each set of chambers.

45 4. The combination with a retort bench, of a plurality of vertical retorts in said bench, said bench being provided with a plurality of heating chambers surrounding said retort, baffle walls in said chambers to
 50 guide the products of combustion therethrough, said chambers being arranged in sets separated from each other but having the chambers of each set connected, air and gas inlets for each chamber, and a common
 55 outlet for the chambers of each set.

5. The combination with a retort bench, of a plurality of vertical retorts in said bench, said bench being provided with a plurality of heating chambers surrounding said
 60 retorts, baffle walls in said chambers to guide the products of combustion therethrough, said chambers being arranged in sets separated from each other but having the chambers of each set connected, air and gas inlets

for each chamber, a common outlet for the 65 chambers of each set, and means for independently regulating each set of chambers.

6. The combination with a retort bench, of a plurality of vertical retorts in said bench, said bench being provided with a plu- 70 rality of heating chambers surrounding said retorts, baffle walls in said chambers to guide the products of combustion therethrough, said chambers being arranged in sets separated from each other but having the cham- 75 bers of each set connected, air and gas inlets for each chamber, a common outlet for the chambers of each set, and a valve in said outlet for independently regulating each set of chambers. 80

7. The combination with a retort bench, of a vertical retort in said bench, said bench being provided with a plurality of heating chambers surrounding said retort, said chambers being arranged in sets, said sets 85 being separated from each other but the chambers of each set being connected, a gas inlet for each heating chamber, a common outlet for the chambers of each set, a series of recuperator flues for each outlet, and sec- 90 ondary air inlets heated by said recuperator flues for supplying air to each heating chamber.

8. The combination with a retort bench, of a vertical retort in said bench, said bench 95 being provided with a plurality of heating chambers surrounding said retort, said chambers being arranged in sets, said sets being separated from each other but the chambers of each set being connected, a gas 100 inlet for each chamber, a common outlet for the chambers of each set, a valve in said outlet for independently regulating each set of chambers, a series of recuperator flues for each outlet, and secondary air inlets heated 105 by said recuperator flues for supplying air to each of said heating chambers.

9. The combination with a retort bench, of a vertical retort in said bench, said bench being provided with a plurality of heating 110 chambers surrounding said retort, said chambers being arranged in sets, said sets being separated from each other but the chambers of each set being connected, a gas inlet for each heating chamber, an outlet for 115 each set of chambers, a valve in each of said outlets for independently regulating each set of chambers, a series of recuperator flues for each outlet, secondary air inlets heated by said recuperator flues for supplying air to 120 each heating chamber, and a valve for each of said secondary inlets.

10. The combination with a retort bench, of a vertical retort in said bench, said bench being provided with a plurality of heating 125 chambers surrounding said retort, said chambers being arranged in sets, said sets being separated from each other but the

chambers of each set being connected, a furnace, a gas inlet leading from each of said heating chambers to said furnace, a secondary air supply for each of said chambers, an outlet for each set of chambers, and a valve in each of said outlets to independently control the supply of gas from said furnace to each set of heating chambers.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence 10 of the two subscribing witnesses.

D. R. RUSSELL. [L. s.]

Witnesses:

W. A. ALEXANDER,
A. C. FOWLER.