

No. 714,645.

Patented Nov. 25, 1902.

H. J. MATHIAS.
COOKING RANGE.

(Application filed Dec. 13, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1

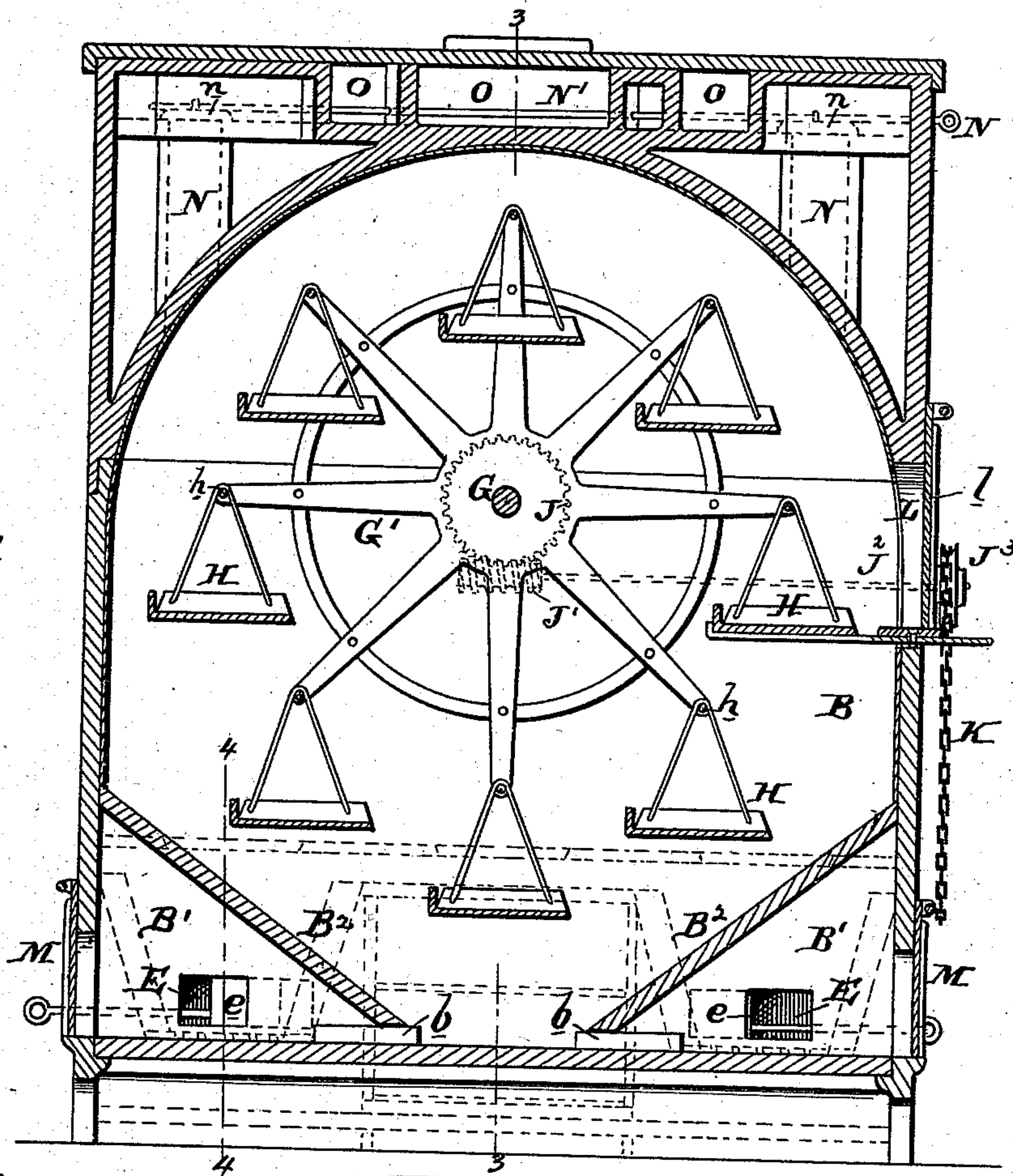
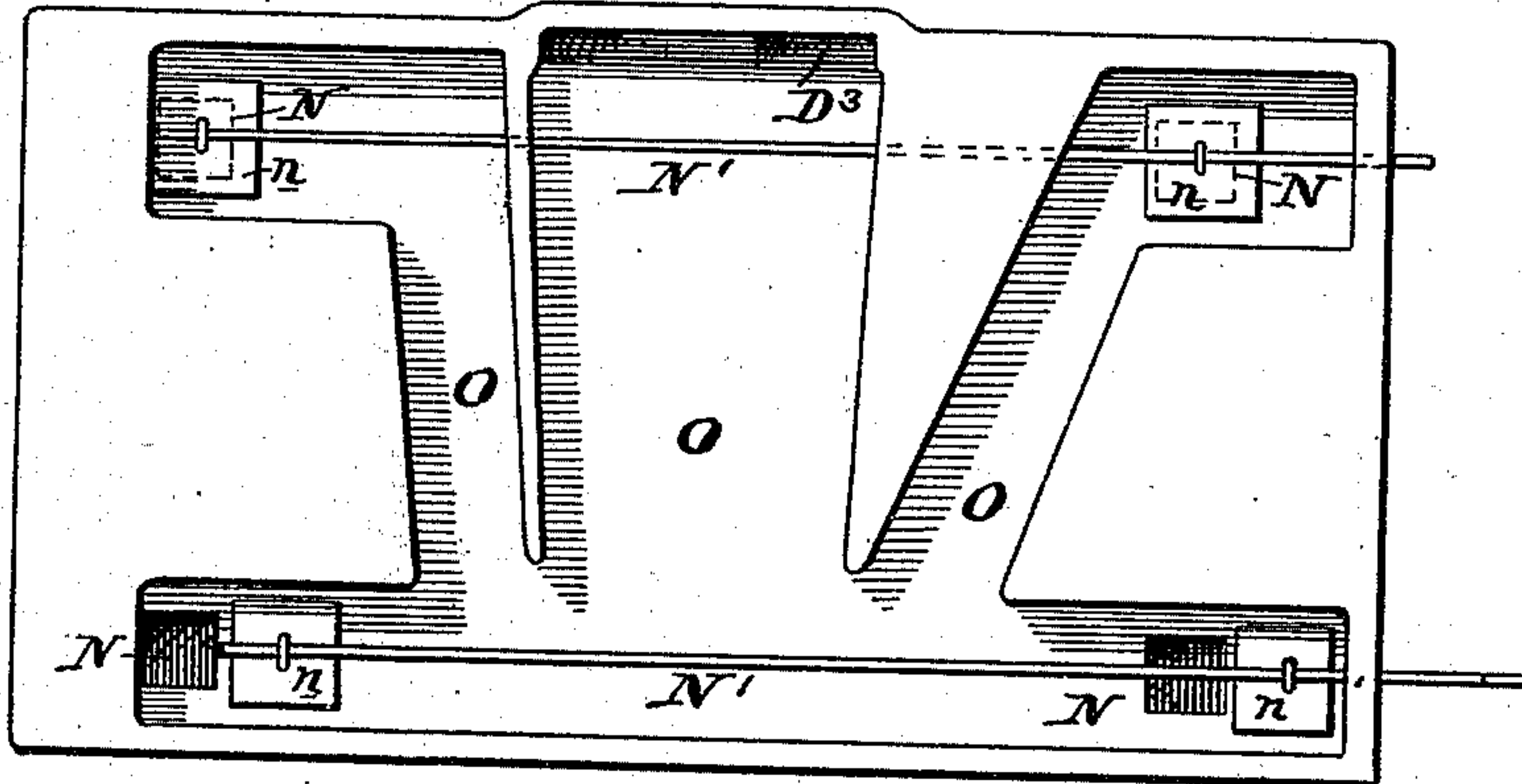


Fig. 2.



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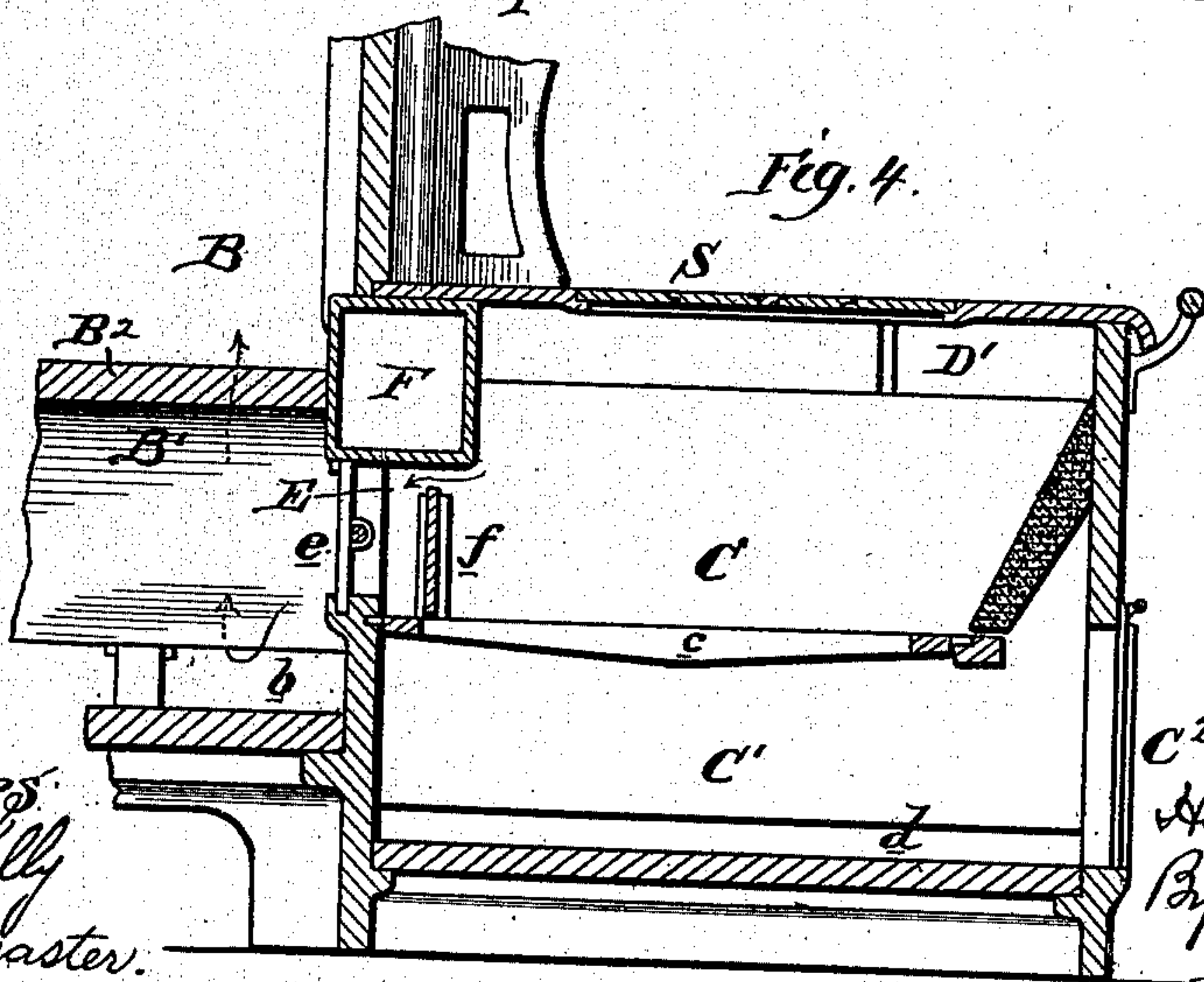
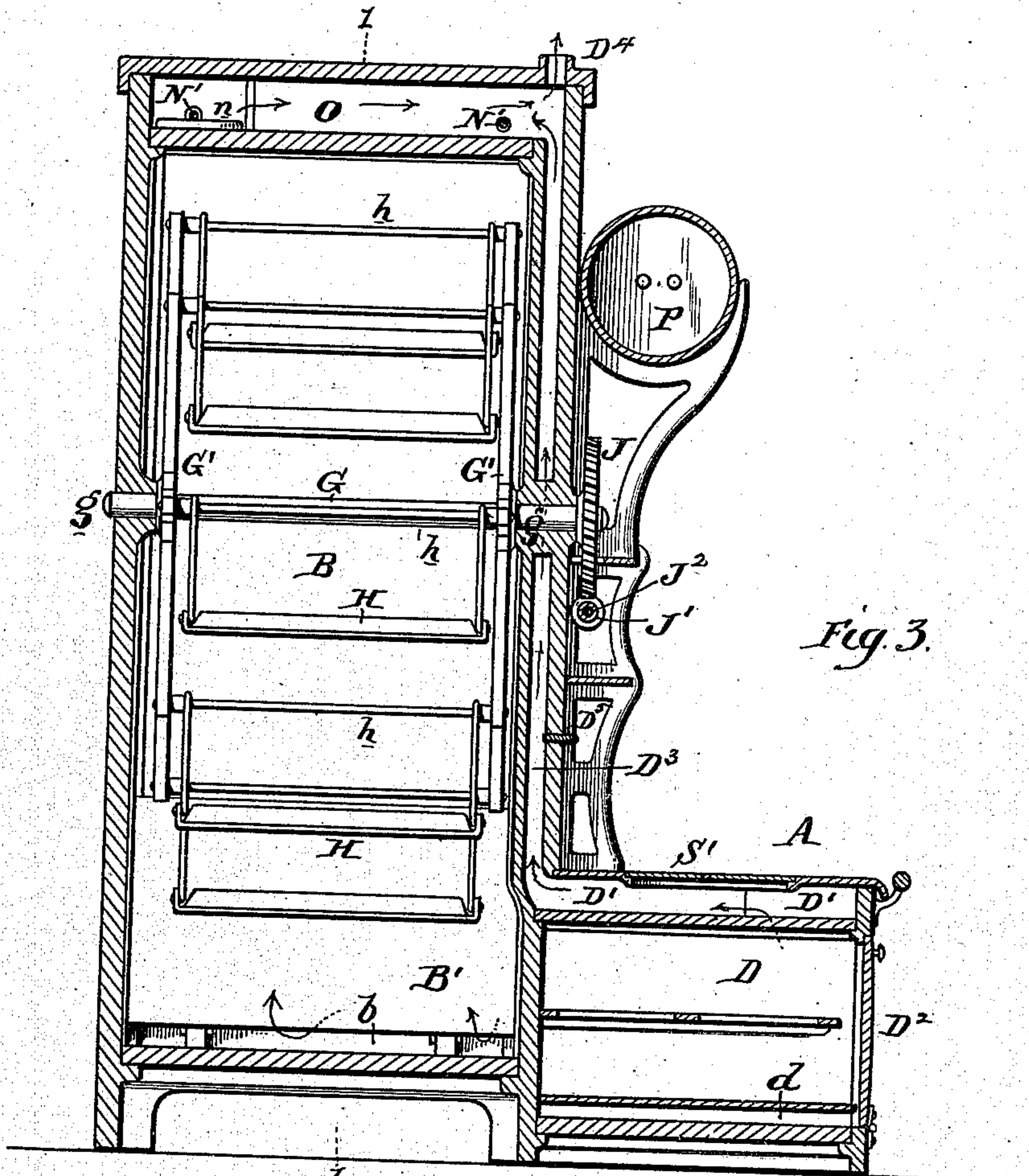
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3 Sheets—Sheet 2.



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COOKING RANGE.

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3 Sheets—Sheet 3.

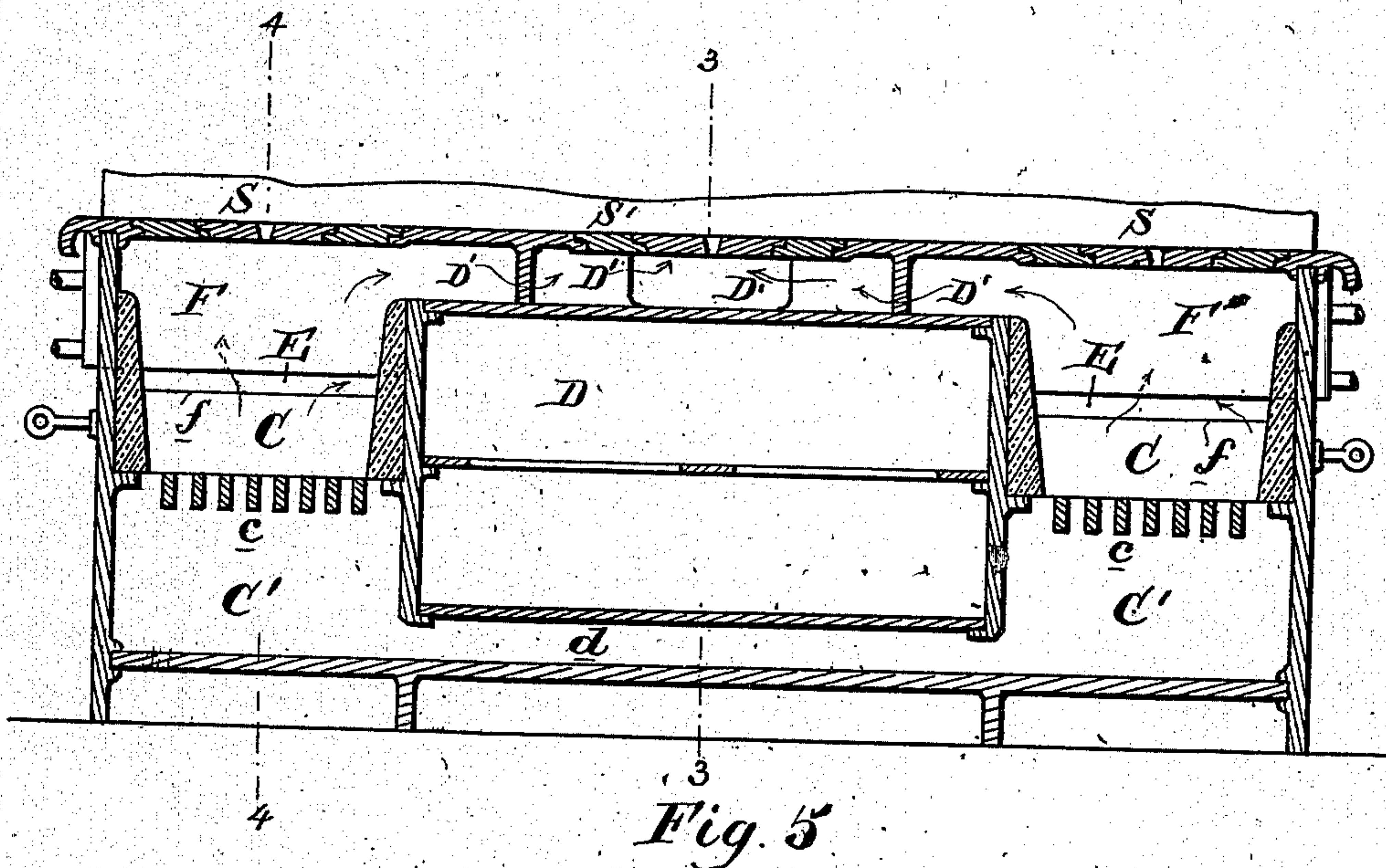


Fig. 5

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UNITED STATES PATENT OFFICE.

HENRY J. MATHIAS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN THOMAS CROSSLEY, OF PHILADELPHIA, PENNSYLVANIA.

COOKING-RANGE.

SPECIFICATION forming part of Letters Patent No. 714,645, dated November 25, 1902.

Application filed December 13, 1901. Serial No. 85,748. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. MATHIAS, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Cooking-Ranges, of which the following is a specification.

My invention has reference to cooking-ranges; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a construction of range suitable for large hotel or restaurant purposes, where a specially large capacity is necessary.

My object is, further, to so construct the range that the contents of the oven can be conveniently and quickly handled and its contents subjected to proper temperature for the cooking operation.

In carrying out my invention I provide the fire chambers or pots with smoke-outlet flues leading to the chimney and with hot-gas flues leading into the oven-chamber, the latter being conveniently arranged at the rear of the fire-chambers and furnished with escape-flues at the top or upper part for the escape of the hot gases and vapors and to insure circulation of the heating-gases. The oven is very large and is provided with a rotary wheel-carrier structure, upon the periphery of which is hung a series of swinging shelves to receive the materials to be cooked, the said carrier being adapted to be rotated by hand from time to time to shift the position of the materials within the oven and also to bring the several shelves before a door through which the uncooked materials may be passed to the shelves and the cooked materials taken from the shelves and oven.

The cooking-gases from the fires are controlled by suitable valves independently of the escape of the smoke products, which pass up the chimney-flue.

My invention also comprehends many details of construction, all of which will be better understood by reference to the drawings, in which—

Figure 1 is a vertical sectional elevation through the rear oven portion of my range,

taken on line 1 1 of Fig. 3. Fig. 2 is a plan view of the top flues and valves of the oven with the cap-plates removed. Fig. 3 is a cross-sectional elevation of my range on line 3 3 of Fig. 1. Fig. 4 is a cross-section of a portion of the range on line 4 4 of Fig. 1, and Fig. 5 is a cross-section through the range portion on line 5 5 of Fig. 3.

A is the front or fire-grate portion of the range, and B is the rear or cooking-oven portion thereof. Referring to the part A, I employ two fire-grates *c* and pots *C*, one on each side and with an oven *D* between them, the relative location of the parts being shown in dotted lines in Fig. 1. The coal to these fire-pots is admitted through the lids *S*, of usual construction. Below the grates *c* are the ash-pits *C'*, having suitable doors *C²* in front, and said ash-pits communicate with each other by flue *d*, passing under the intermediate oven *D*. The smoke from the fires by regulation of the dampers *D⁵* *e* passes by smoke-flues *D'* over the oven *D*, and thence by a chimney-flue *D³*, and escapes to the chimney of the building by the outlet *D⁴*. The flue *D³* may be provided with any of the ordinary and customary valves or dampers to control the draft, such a valve being indicated at *D⁵*. The oven *D* is provided with a front door *D²* and is heated on the sides by the fire-pots, on the top by the smoke products, and on the bottom by the hot air in flue *d*. A lid *S'* may be placed in the range-top above the flues *D'* immediately above the oven *D*. The fire-pots *C* may be suitably lined with fire-brick or otherwise formed, as desired. At the rear of the fire-pots *C* are the flues *E*, leading into the chambers *B'* of the large oven *B*, and said flues are provided with the valves *e* for controlling the heated gases passing to the oven. Immediately at the rear of the grates *c* and extending upward are cross-plates *f*, which act to retain the coal and also as deflectors to direct the hot gases upward against the water-backs *F* in the act of escaping to the oven through the flues *E*. These water-backs *F* may be of any suitable construction and in the usual manner heat the water of the hot-water boiler at *P*. They sustain the coal in the fire-pots which may be above the deflectors *f*.

The oven-chamber B is very large, and preferably approximating a circle, the top being made circular to secure reverberatory action and the bottom being provided with the inclined floors B² to form the chambers B', opening at *b* into the lower central portion of the oven-chamber B. These chambers B' receive the hot cooking-gases through the valved flues E and deliver them to the bottom central portion of the oven. These floors B² are preferably made of soapstone or other highly-refractory material.

The chambers B' may be cleaned from time to time through the doors M, and these may also be the means through which any deposits may be raked which may settle on the floor of the oven between the two openings *b b*.

The upper portion of the oven may be constructed of sheet or cast iron or built of refractory material, such as fire-brick, if so desired. Within this oven is a suitable carrier-wheel frame or structure G', secured upon and revolving with a shaft G, journaled in the front and rear walls of the oven at *g*. This wheel structure has at its periphery or extremity of its arms the cross-rods *h*, upon which are hung swinging trays H, which always retain their position under the action of gravity and at the same time permit the wheel structure to be rotated to shift the position of any tray within the oven and also to bring any tray and contents into position before the doorway L when the door *l* is opened, so that the cooked material may be withdrawn. To hold the tray H from swinging at this time, I provide a pivoted arm P in the side of the oven below the doorway L, which on being turned laterally under the tray holds it against downward motion and also against backward movement. This arm P is only used when inserting or removing from the oven an article. The shaft G is provided on its end with a worm-wheel J, which is driven by a worm J' on a horizontal shaft J². The shaft J² is rotated by a wheel J³, over which a chain K passes, to be operated by hand. Any other suitable power device may be employed to rotate shaft G and the oven wheel structure G'.

N N are flues through the upper part of the oven-wall and open into hot-air flues O, above the oven, leading to the smoke-chimney outlet D⁴, before referred to. These flues, as shown, are so disposed as to heat as far as possible the upper part of the oven. The flues N are provided with regulating-valves *n*, connected in pairs and operated by rods N', leading to the outside of the oven structure. While I have shown four flues N, I do not limit myself to any number of flues, as they may be increased or diminished in number to suit the size of the oven.

In the operation of my improved range by properly adjusting the parts no smoke will pass into the oven, and in starting the same the dampers are all adjusted to send all the products directly to the chimney until the

fuel is in such condition that the products can pass through the oven without injuring the contents thereof. When this latter condition takes place, the dampers are regulated, so that the hot gases which are free from objectionable constituents and excellently adapted for cooking purposes may pass through the flues E into the oven. The unconsumed carbon and objectionable constituents pass off from the upper part of the bed of fuel into the smoke-flue.

While I have shown two fire-grates in the range, it is to be understood that I do not confine myself to the use of two such grates, as one alone may be employed, if desired.

I have found that the construction herein set out is excellently adapted in practice for the embodiment of my invention; but I do not confine myself to the details here shown, as they may be greatly modified without departing from the essential features of my improvements.

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

1. A cooking-range having one or more fire pots and grates, combined with an oven, a smoke-flue from the top of the fire-pots, one or more gas-flues from the sides of the fire-pots below the top of the bed of coal and opening into the oven, and one or more escape-flues from the top of the oven.

2. A cooking-range having one or more fire pots and grates, combined with an oven, a smoke-flue from the top of the fire-pots, one or more gas-flues from the sides of the fire-pots below the top of the bed of coal and opening into the oven, one or more valves to control the gases passing through the gas-flues, and one or more escape-flues from the top of the oven.

3. A cooking-range having one or more fire pots and grates, combined with an oven, a smoke-flue from the top of the fire-pots, one or more gas-flues from the sides of the fire-pots below the top of the bed of coal and opening into the oven, a rotating wheel structure pivoted within the oven provided with swinging trays, a door in the side of the oven in line with the trays and one or more escape-flues from the top of the oven.

4. A cooking-range having one or more fire pots and grates, combined with an oven, a smoke-flue from the top of the fire-pots, one or more gas-flues from the sides of the fire-pots below the top of the bed of coal and opening into the oven, a rotating wheel structure pivoted within the oven provided with swinging trays, power devices extending to the outside of the oven for rotating the wheel structure and trays, a door in the side of the oven in line with the trays, and one or more escape-flues from the top of the oven.

5. In a cooking-range a fire-pot having a smoke-flue opening from its upper part, a large oven-chamber, a movable carrier structure within the oven-chamber for supporting the

articles to be cooked, a valved flue leading from the side of the fire-pot below the top of the bed of coal into the lower part of the oven, and an escape-flue from the top of the oven.

5 6. In a cooking-range a fire-pot having a smoke-flue opening from its upper part, a large oven-chamber, a movable carrier structure within the oven-chamber for supporting the articles to be cooked, means to move the
10 movable carrier structure from without the oven, a valved flue leading from the side of the fire-pot below the top of the bed of coal and into the lower part of the oven, and a valve-controlled escape-flue from the top of
15 the oven.

7. In a cooking-range the combination of the fire-pot C having grate *c*, smoke-flue D' opening from its upper part, rear partition or wall *f*, an oven to the rear of the fire-pot,
20 a flue E opening from the fire-pot above the wall *f* and directly into the oven, and a valve *e* to control the orifice of the flue E.

8. In a cooking-range the combination of the fire-pot C having grate *c*, smoke-flue D' opening from its upper part, rear partition or wall *f*, an oven to the rear of the fire-pot,
25 a flue E opening from the fire-pot above the wall *f* and into the oven, water-back F forming a back for the fire-pot and roof of the
30 flue E, and a valve *e* to control the orifice of the flue E.

9. In a cooking-range, the combination of the two fire pots and grates, an oven interposed between them, a smoke-flue over the
35 oven and leading from both fire-pots, a large oven at the rear of a width approximately equal to the front oven and both fire-pots, and valved flues opening from the two fire-pots at the rear into the rear oven.

40 10. In a cooking-range, an oven-chamber made curved at the top and having inclined floors B² B² at the bottom forming chambers

B' opening into the oven near the center by flues *b b*, combined with two fire-pots, a chimney-flue leading from the fire-pots, and flues
45 leading respectively from the two fire-pots and respectively opening into the chambers B' of the oven.

11. In a cooking-range, an oven-chamber made curved at the top and having inclined
50 floors B² B² at the bottom forming chambers B' opening into the oven near the center by flues *b b*, combined with a rotating carrier within the oven for supporting the materials to be cooked, two fire-pots, a chimney-flue
55 leading from the fire-pots, and flues leading respectively from the two fire-pots and respectively opening into the chambers B' of the oven.

12. In a cooking-range, a fire-pot having a
60 smoke-flue opening from its upper part, an oven-chamber having inclined floors forming chambers B', a movable carrier structure within the oven-chamber, an escape-flue from the top of said chamber and a valved flue
65 leading from the fire-pot below the top of the bed of fuel into the lower part of the oven.

13. In a cooking-range, a fire-pot having a smoke-flue opening from its upper part, an oven-chamber having inclined floors forming
70 chambers B', a movable carrier structure within the oven-chamber, an escape-flue from the top of said chamber, a valved flue leading from the fire-pot below the top of the bed of fuel into the lower part of the oven, and pas-
75 sages beneath said inclined bottoms connecting the oven proper with said chambers.

In testimony of which invention I hereunto set my hand.

H. J. MATHIAS.

Witnesses:

ERNEST HOWARD HUNTER,
J. W. KENWORTHY.