

C. F. & F. L. GRADY.

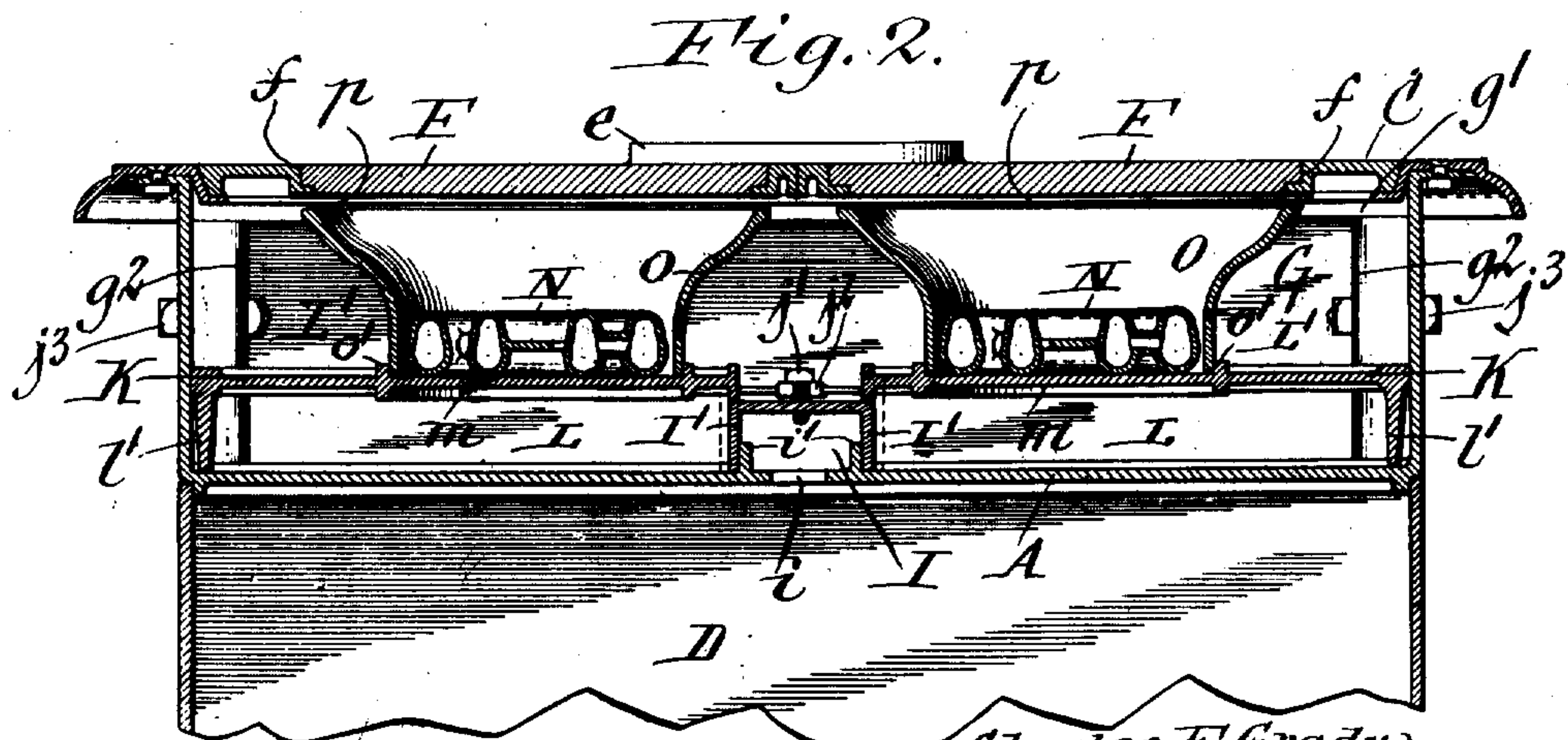
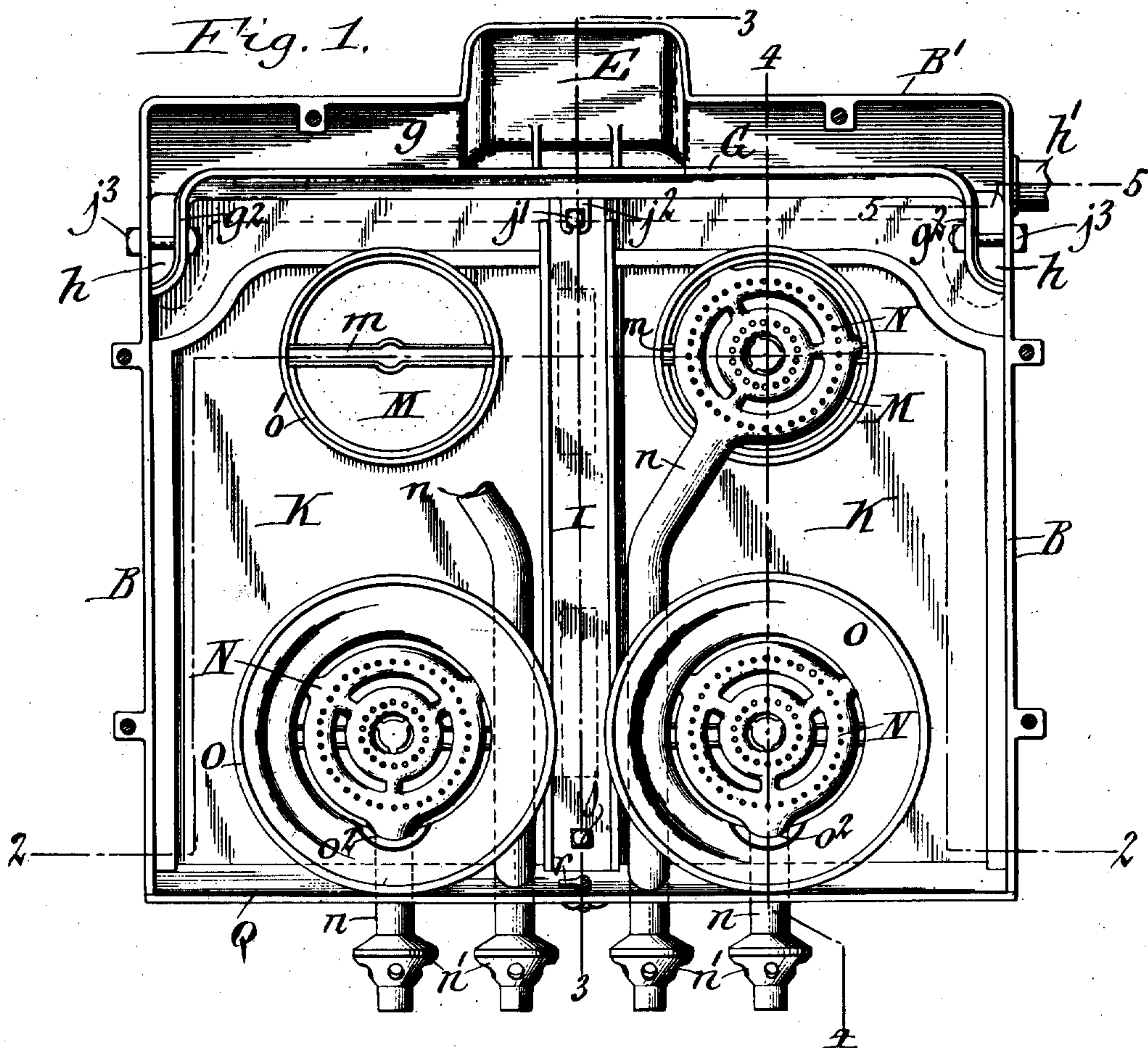
GAS STOVE.

APPLICATION FILED JULY 3, 1907.

Patented Oct. 13, 1908.

2 SHEETS—SHEET 1.

900,998.



Richard Sommer
Gustav W. Hoes } Witnesses.

Charles F. Grady } Inventors
Frank L. Grady }
by Cuyler & Poff } Attorneys

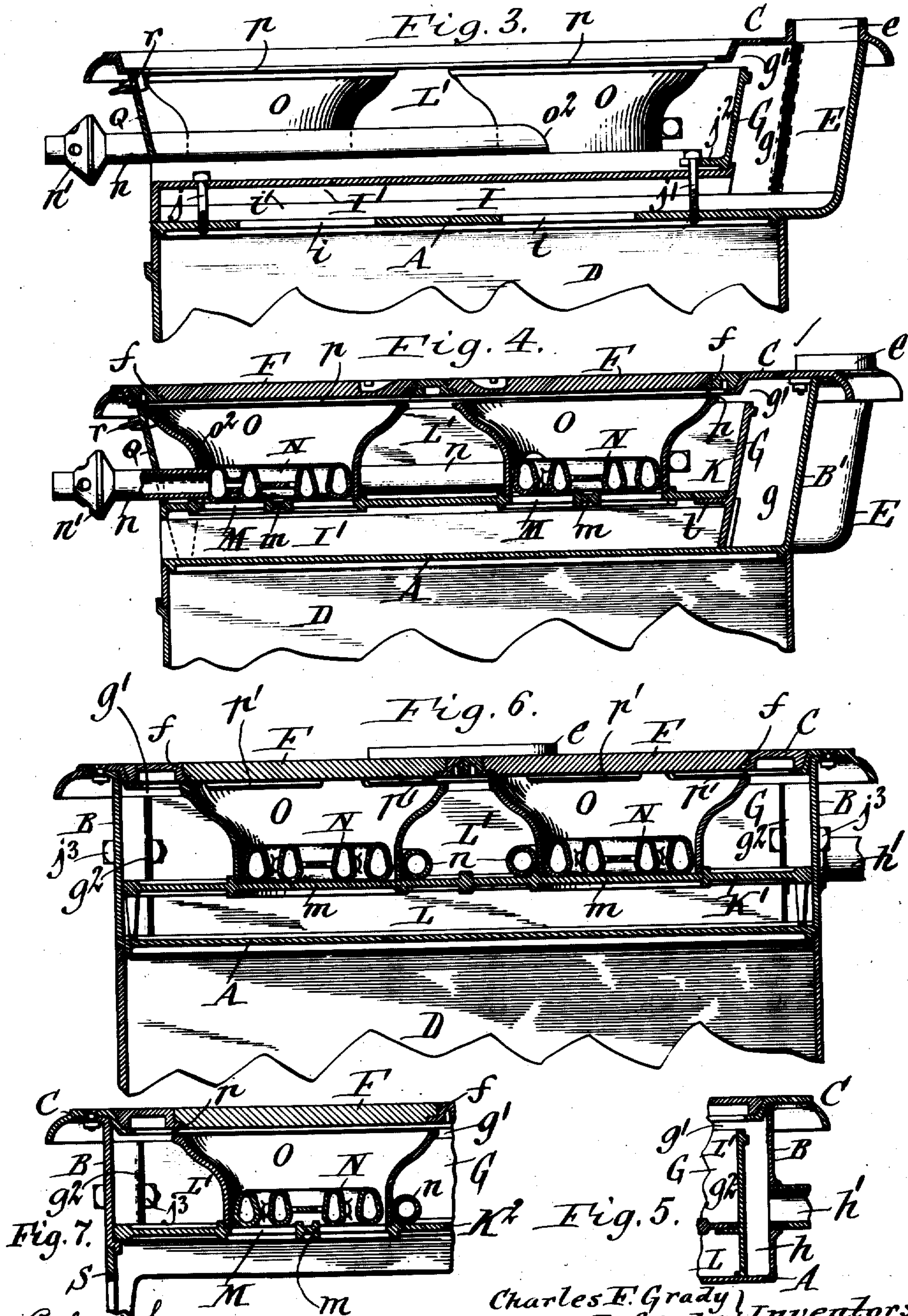
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by C. E. & P. H. } Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES F. GRADY AND FRANK L. GRADY, OF BUFFALO, NEW YORK.

GAS-STOVE.

No. 900,998.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed July 3, 1907. Serial No. 381,904.

To all whom it may concern:

Be it known that we, CHARLES F. GRADY and FRANK L. GRADY, citizens of the United States, and residents of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Gas-Stoves, of which the following is a specification.

This invention relates to gas and vapor stoves and more particularly to ranges and has for its object to produce a stove of this character in which the air supply is controlled so as to prevent an excess of air being admitted to the burners and the outlet flues and which provides free ventilation for the burners of the stove and any attachments to the same.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a top plan view of our improved gas or vapor stove showing the top, lid and other parts removed for clearness of illustration. Fig. 2 is a vertical cross section thereof in line 2—2, Fig. 1. Figs. 3 and 4 are vertical longitudinal sections in lines 3—3, and 4—4, Fig. 1, respectively. Fig. 5 is a fragmentary vertical cross section in line 5—5, Fig. 1. Fig. 6 is a cross section, similar to Fig. 2, showing a modified construction of our invention. Fig. 7 is a fragmentary view like the last mentioned, showing another modification.

Similar letters of reference indicate corresponding parts throughout the several views.

Referring to the construction shown in Figs. 1—5, A represents the bottom, B, B¹ the side and rear walls, and C the top, respectively, of the body of the stove. This body rests with its bottom on top of an oven D of any usual or approved construction such as are commonly used in connection with gas stoves. On the central part of the rear wall is formed a rearwardly projecting pocket or bay E which opens at its upper end into an outlet/collar or nozzle e on the rear part of the top which forms the outlet of the stove and may receive a pipe whereby the stove is connected with the chimney.

In top of the body are the holes f over which the cooking dishes are placed, four of such holes being preferably employed and distributed over the area of the top and each normally closed by a solid lid F in the usual manner but if desired the same may be bridged by a skeleton grid for supporting a cooking dish or it may be left open.

G represents an upright partition arranged

transversely in the rear part of the space within the body and extending from the bottom thereof to within a short distance of the top, thereby forming a transverse main flue or conduit g in the body between the partition and the rear wall B¹ and a narrow transverse passageway or slit g¹ between the upper end of the partition and the top of the body which connects the space within the upper front part of the body with the flue g, as shown in Figs. 1, 3 and 4.

The central part of the vertical partition G is arranged lengthwise of the rear wall B¹ but its end part g² is preferably extended forwardly lengthwise of the side walls B, as shown in Figs. 1 and 5, forming an enlargement h of the main flue g at opposite ends thereof to permit of conveniently connecting therewith the outlet flue h¹ of an adjacent water heater, broiler or the like, thereby avoiding the necessity of making separate chimney connections for this purpose without however interfering with the draft of the gas or vapor stove. Lengthwise above the central part of the bottom of the body is arranged an oven flue or conduit I which communicates by means of openings i in the body bottom with the oven while its rear end communicates with the main flue g, thereby conducting the gases from the oven to the chimney. This oven flue is preferably formed by means of an inverted U-shaped hood the longitudinal side walls I¹ of which engage with guide ribs i¹ on the upper side of the body bottom. The vertical partition G and the hood may be secured in place in any suitable manner but preferably by the means shown in Figs. 1, 2 and 3 consisting of a vertical front screw j passing through the front of the hood and the bottom, a vertical rear screw j¹ passing through the rear part of the hood and the bottom and also through a lug j² on the vertical partition, and horizontal side screws or bolts j³ passing through the side walls of the body and the end extensions of the vertical partition.

Horizontally within the stove body is a partition which divides the space within the same in front of the vertical partition into an upper burner or heating chamber L¹ and a lower air conduit or chamber L. As shown in Figs. 1 and 2 this horizontal partition is constructed in two sections K, K each of which rests with its inner longitudinal edge on the adjacent part of the oven flue, and rests with its rear edge on a horizontal

flange *l* formed on the front side of the vertical partition and the same is supported at its front outer corner by a leg *l'* formed on the underside of this partition section and resting on the bottom of the stove body, as shown in Figs. 2 and 4.

Any desired number of air openings *M* may be formed in the horizontal partition but as shown each of the horizontal partition sections has two of such air openings which are one behind the other and each vertically in line with the companion lid opening in the top of the stove. Above each of these air openings is arranged a burner *N* of any suitable construction which is preferably supported by a cross bar *m* extending across said opening. These burners are supplied with gas by means of tubular shanks *n* extending horizontally and lengthwise forward through the burner chamber to the front side of the stove where they are provided with air mixers *n'* of any suitable construction.

Each burner is surrounded by a circular or tubular guard, shield or bowl *O* which forms a combustion chamber around the burner. Each guard preferably rests with its lower end within a guide rim or flange *o'* on the respective horizontal partition section while its upper large end surrounds the respective lid opening and terminates short of the underside from the stove top leaving a narrow annular outlet opening, space or slit *p* between the guard and said top, as best shown in Figs. 2 and 4. Instead of making the outlet space between the top of each guard and the stove top in the form of a continuous slit *p*, as shown in Figs. 2 and 4, the guard may be carried up to the stove top and provided at its upper end with an annular series of openings *p'*, as shown in Fig. 6. This guard flares upwardly, the diameter of its upper or large end being preferably the same as the diameter of the respective lid opening while its lower small end is comparatively close to the burner. The lower edge of each guard is preferably provided with a notch *o''* which receives the tubular shank of the respective burner.

The front end of the burner chamber is preferably closed by an upright plate, shutter or wall *Q* which is provided in its lower edge with suitable means for receiving the front parts of the tubular shanks and which is preferably detachably secured in place by a turn button *r* engaging with the stove top, as shown in Fig. 3, or by any other suitable means.

In the operation of this stove the bulk of the air for supporting combustion enters the two sections of the air chamber or flue *L* through the open front ends thereof and then passes upwardly through the openings *M* in the sections of the horizontal partition where it combines with burning gas at the burners for producing the heating flames. The area

of the air supply openings in and around the burner is so regulated or determined that only so much air is admitted to each burner as is necessary to effect complete combustion of the gas. By this means the cooling effect of an excess amount of air is avoided and permits of obtaining thorough combustion and full heating capacity of the gas. Furthermore, fresh air only is by this means admitted to the burning gas and not air which has been contaminated by the products of combustion from other burners.

All products of combustion pass from the inner sides of the burner guards through the passage-ways between the upper edges of the guards *O* and the stove top into the outer part of the burner chamber, thence rearwardly through the passage-way between the upper edge of the vertical partition *G* and the stove top into the transverse flue, and thence rearwardly into the pocket *E* and upwardly through the collar or nozzle *e* to the stove-pipe and chimney.

By confining air around the burners by means of the guards or shields and restricting the outlet between the same and the stove top, no part of the air which is admitted can escape without first becoming mixed or in direct contact with the burning gases and serving its purpose as an aid to effect thorough combustion. Furthermore, the shields protect the burners so that the products of combustion of one burner will not interfere with the combustion of gases in another burner and the shields also concentrate and retain the heat under the cooking dish or utensil in use above the respective burners.

Inasmuch as no more air is supplied to the burners than is necessary to effect complete combustion there is no surplus air to carry away, thus avoiding congestion of the conduits and preventing interference with the draft on the oven or other appliances which may be connected with the flue system of the stove. The supply of air to each burner may be adjusted or controlled either by the size of the air openings *M* or the relative position of the burner to said openings.

The outlet for each burner between its companion bowl shaped guard and the top of the stove is of such capacity that it will properly carry away the products of combustion developed by that particular burner and the relation of this outlet to the lid opening above the same is such that when the lid thereof is opened it will not permit an undue draft from the same into the flues and chimney.

The advantage in employing a vertical partition across the rear of the combustion chamber is that it provides a flue to the ends of which the flues of water heaters, broilers &c. may be connected and it also enables the passage-way connecting the burner chamber and the main transverse flue to be extended

which insures the necessary draft for effectually carrying away the burned gases from the different burners while at the same time preventing any material checking of the draft when the lids over the burners are removed or skeleton griddles are substituted for the solid lids or when the front is left open.

The advantage in the use of the oven flue is that it provides a convenient and cheap construction and when combined with the transverse rear flue a positive draft for the oven is obtained which insures sufficient air being drawn to the oven burner to effect complete combustion and it also insures the escape of all odors from the oven to the chimney.

If desired the oven flue in the gas stove may be omitted, as shown in Fig. 6, in which case the horizontal partition K^1 may be formed in one piece and the products of combustion from the oven may be otherwise disposed of.

When the stove is intended for use without an oven, the bottom A of the body may be omitted in which case the horizontal partition K^2 forms the bottom of the burner chamber and air is admitted directly into the same through the openings M in this horizontal partition or bottom and the latter is held in an elevated position by legs S or other suitable support, as shown in Fig. 7.

Although the best results are obtainable by using the shutter or wall Q for preventing entrance of air at the front end of the burner chamber the same if desired may be omitted and still retain the advantages due to other novel features of construction in this stove. It is also not necessary that this stove be connected with a chimney as most of the advantages will be retained by disposing of the products of combustion otherwise.

We claim as our invention:

1. A stove having a burner chamber provided with an outlet, and a stationary vertical partition arranged transversely within the chamber adjacent to said outlet and terminating at its upper end short of the top of the chamber forming a passage between these parts for the products of combustion, substantially as set forth.

2. A stove having a burner chamber provided with an outlet at its rear, burners arranged in said chamber and a vertical partition arranged within the rear part of said chamber adjacent to the outlet and having one part arranged parallel with the rear wall of the chamber, and an end portion extending parallel with the adjacent side wall of the chamber, substantially as set forth.

3. A stove having a burner chamber provided with an outlet at its rear, burners arranged in said chamber and a vertical partition arranged within the rear part of the chamber adjacent to the outlet and having

its central part arranged parallel with the rear wall of the chamber and both of its end parts extended parallel with the side walls of the chamber, substantially as set forth.

4. A stove comprising a body having an outlet at one end and openings in its bottom for communication with an oven, a vertical partition arranged transversely within the body adjacent to the outlet forming a main flue, an oven flue communicating on its underside with said oven openings while one of its ends opens into said main flue, a horizontal partition arranged in said body and dividing the same into an upper burner chamber and a lower air supply chamber and having one or more air inlet openings, and a burner arranged above each of said air inlet openings, substantially as set forth.

5. A stove comprising a body having an outlet at one end and openings in its bottom for communication with an oven, a vertical partition arranged transversely in the body adjacent to the outlet and forming a main flue, an oven flue arranged on said bottom over said oven openings and communicating at one end with said main flue, a horizontal partition arranged in the body and dividing the same into an upper burner chamber and a lower air supply chamber and having air inlet openings, and a burner arranged over each air supply opening, substantially as set forth.

6. A stove comprising a body having an outlet at one end and openings in its bottom for communication with an oven, a vertical partition arranged transversely in the body adjacent to the outlet forming a main flue, an oven flue arranged on said bottom over said oven openings and communicating at one end with said main flue, a horizontal partition arranged in the body and dividing the same into an upper burner chamber and a lower air supply chamber and having air inlet openings, a burner arranged over each air supply opening, and a shield arranged in the burner chamber around each burner and its air inlet opening, substantially as set forth.

7. A stove comprising a body having an outlet at one end and oven openings centrally in its bottom for connection with an oven, a vertical partition arranged transversely in the body adjacent to the outlet and forming a main flue, an oven flue arranged on the bottom of the body over said oven openings and connecting the same with the main flue, a horizontal partition which divides the body into an upper burner chamber and a lower air supply chamber and consisting of two sections arranged on opposite sides of the oven flue, each section being provided with air supply openings, and a burner arranged in the burner chamber over each of said air supply openings, substantially as set forth.

8. A stove comprising a body having an outlet at one end and oven openings centrally in its bottom for connection with an oven, a vertical partition arranged transversely in the body adjacent to the outlet and forming a main flue, an oven flue arranged on the bottom of the body over said oven openings and connecting the same with the main flue, a horizontal partition which divides the body into an upper burner chamber and a lower air supply chamber and consisting of two sections arranged on opposite sides of the oven flue, each section being pro-

vided with air supply openings, a burner arranged in the burner chamber over each of said air supply openings, and a tubular shield arranged in the burner chamber around each burner and its air supply opening, substantially as set forth.

Witness our hand this 14th day of June, 20 1907.

CHARLES F. GRADY.
FRANK L. GRADY.

Witnesses:

M. J. TERRY,
CHARLES V. LYNCH.