

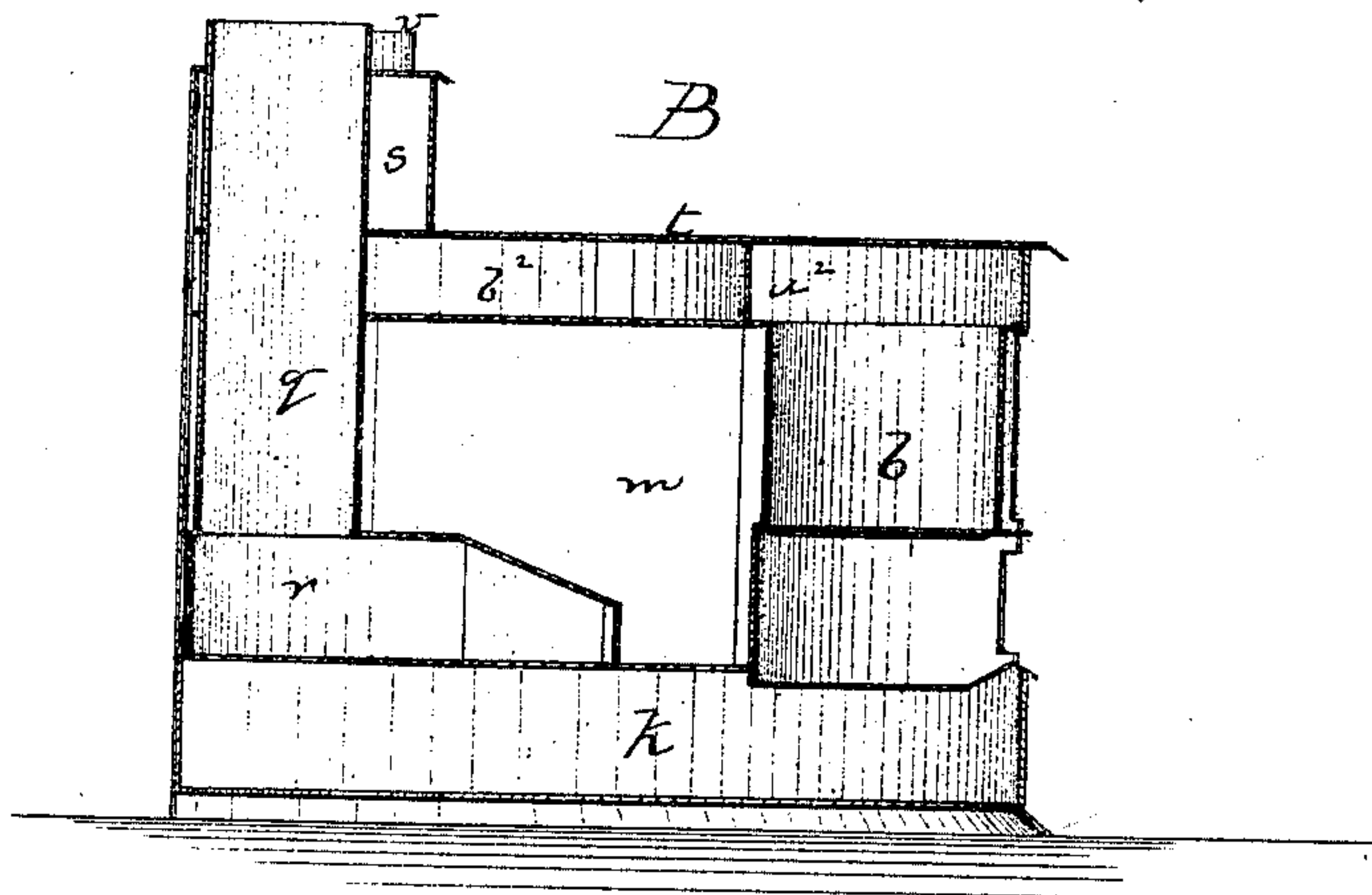
G. W. Walker,

2. Sheets, Sheet 1.

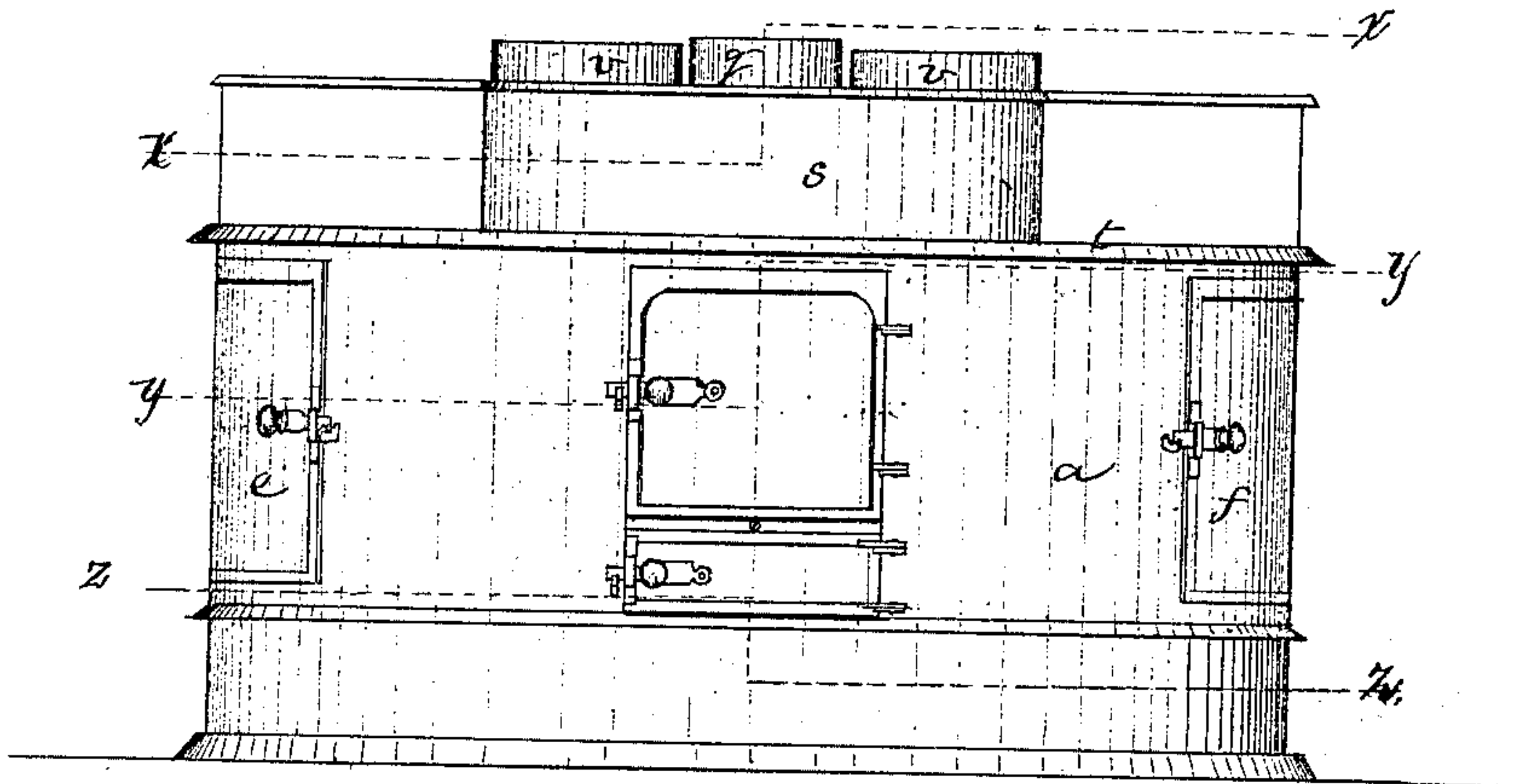
Range.

No. 113,952.

Patented Apr. 18. 1871.



A



Witnesses { M. W. Frothingham.  
L. H. Latimer,

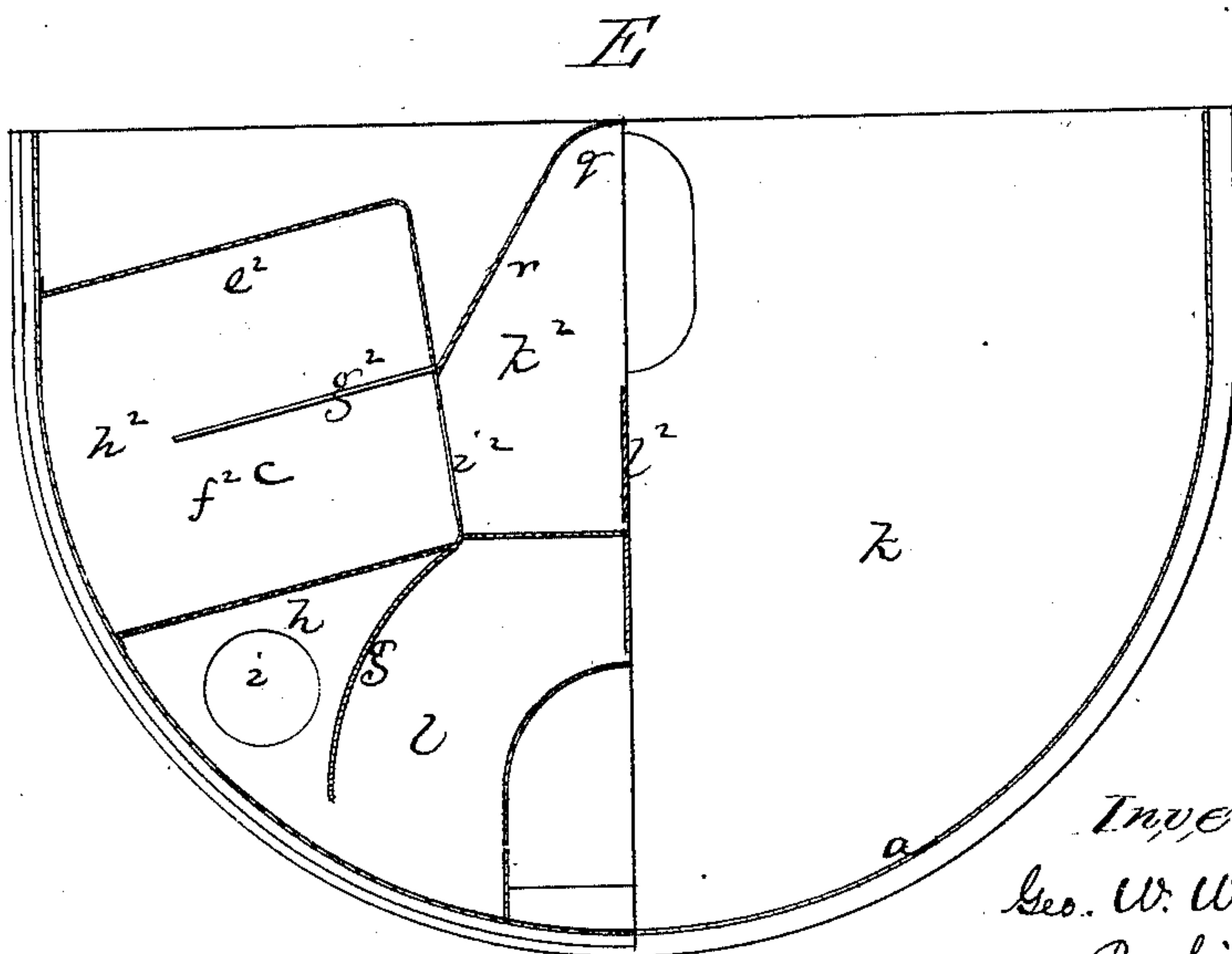
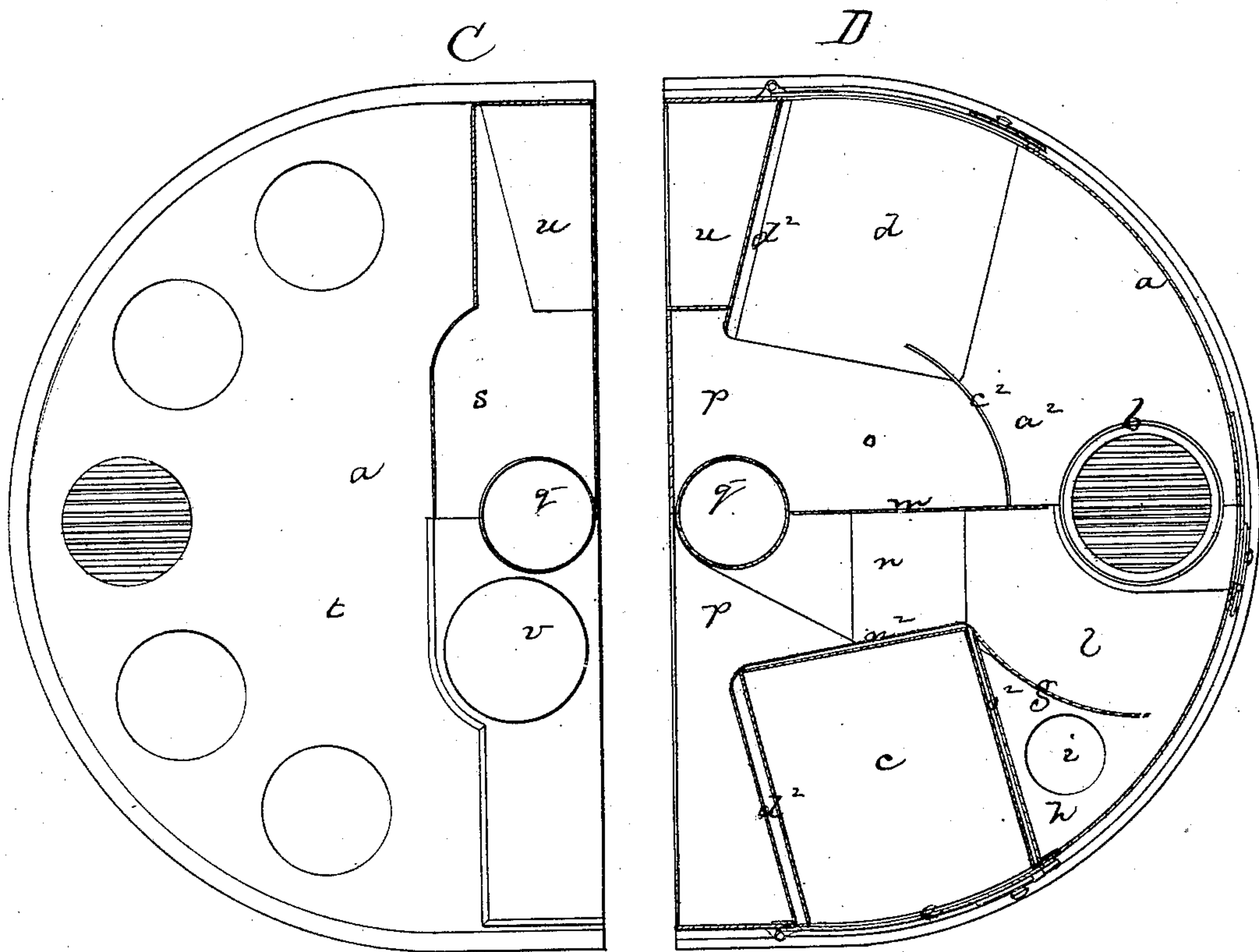
Geo. W. Walker.  
By his Atty.  
Crosby & Gould

G. W. WALKER.

Range.

No. 113,952.

Patented Apr. 18, 1871.



Witnesses

{ M. W. Frothingham  
L. H. Latimer

Inventor  
Geo. W. Walker.

By his Atty.  
Crosby & Gould



# United States Patent Office.

GEORGE W. WALKER, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 113,952, dated April 18, 1871.

## IMPROVEMENT IN COOKING-RANGES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, GEORGE W. WALKER, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Cooking and Heating-Range; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to the construction of ranges for combined heating and cooking purposes, the invention having particular reference to the relative arrangement of the fire-pot, the ovens, the flues through which the smoke and other volatile products of combustion pass from the fire-pot to the chimney, and the air-passages through which cold air, received at the lower part of the range and warmed by contact with heat-radiating plates or partitions, passes and escapes into the hot-air conducting-pipes, to be by them conveyed to the apartments in which heated air is to be disseminated.

The invention consists, primarily, in the combination, with a fire-pot located in the front and central part of a range-body, (preferably made semi-cylindrical in form,) and with ovens extending radially into said body at or near the opposite ends thereof, of hot-air flues or passages occupying the segmental spaces between the fire-pot and the ovens or oven-flues; the hot-air passage on each side of the fire-pot being preferably divided by a vertical partition, so that the cold air received from beneath the range into the space next to the oven on one side of such partition passes through such space and then around the front end of the partition into the space on the opposite side of the partition, and next to the fire-pot, and thence back through such space into a vertical space at the end of the oven and at the rear side thereof, from which space it escapes into hot-air pipes leading from the top of such space, or into a hot-air chest which surmounts the back part of the range, from which chest the hot-air distributing-pipes lead, the air being heated in its passage through these hot-air passages, first by the oven-flue plates nearest the fire-pot and the fire-pot surface, and then by the flue-plates at the ends and rear sides of the oven.

The invention further consists in combining with such an arrangement of flues an inclosed sub-space beneath the range, into which space the cold air is first received, becoming partially heated therein before it passes into the segmental hot-air flues or spaces; and

The invention further consists in separating the hot-air spaces between the ovens by a central partition, so that one side of the range may be used in whole or in part for heating air, while the opposite side may have the inlet-passage for cold air or the outlet-pas-

sage for heated air stopped, in which case the radiated heat from the fire-pot on such side will be employed wholly to heat the oven without absorption of the heat by a current of cool air.

The invention further consists (in combination with the system of smoke and hot-air flues) in the employment of a hot-air box or chest, covering the rear part of the upper plate of the range, so that the heat radiated by said plate aids in warming the air.

The invention further consists in the peculiar arrangement of the smoke or fire-pot flues in connection with the arrangement of hot-air passages, the smoke and other volatile products of combustion preferably passing from the fire-pot up under the top or boiler-plate; thence over the ovens (between the oven-plates and top plate) around the ends of a partition to vertical flues at the rear sides of the ovens; thence down such flues into flues under the rear part of each oven; and thence toward the front ends of such flues around partitions into flues under the front part of the ovens; and thence through a flue-opening into a central flue at the rear part of the bottom of the range; and thence into a vertical flue-pipe, from which the smoke and other products of combustion escape into the chimney, there being also thin flue-spaces at the end of and at one side of each oven, which are kept charged with hot air from the fire-pot, but only discharge such air by its displacement (as it becomes cool) by the heated air from the main flues.

The drawing represents a heating and cooking-range embodying my improvements.

A shows a front view of the range.

B is a vertical central section.

C is a horizontal section on the irregular line *x x*.

D is a horizontal section on the irregular line *y y*.

E is a plan of one-half of the range and a section of the other half on the line *z z*.

*a* denotes the body of the range;

*b* the fire-pot, located in the front part of such body; and

*c d* two ovens, the doors *e f* of which open at the opposite ends of the range, each oven being located in the body or extending radially into it and with reference to the fire-pot, as seen at D E.

The space between the fire-pot and the adjacent side of each oven forms a vertical air-chamber, which chamber I preferably divide, by a vertical partition, *g*, into two parts, into the part *h* of which nearest the oven opens an air-inlet, *i*, leading from the space beneath the range, or preferably from an air-chamber, *k*, which may extend under the whole range, the air passing through the air-passage *h* around the front of the partition *g* into the chamber *l* on the other side of the partition next to the fire-pot.

Between the inner ends of the two opposite ovens



is another central and vertical hot-air chamber, divided, by a central partition,  $m$ , into two chambers,  $n$  or  $o$ , each chamber  $n$  or  $o$  opening out of the chamber  $l$  in front of it, and each chamber  $n$  or  $o$  leading into a vertical air-chamber,  $p$ , extending back of the oven, the two rear chambers occupying the space at the back of the range, with the exception of the space taken by the smoke-flue  $q$  and the end of the smoke-flue  $r$ , from which the flue  $q$  leads.

The chamber  $p$  may lead directly into hot-air distributing-pipes, but I prefer to lead them into a hot-air box,  $s$ , covering the rear part of the boiler top or top plate  $t$ , each chamber  $p$  opening into the box by an opening,  $u$ , and the heated air passing through boxes into suitable hot-air distributing-pipes  $v$  leading to the apartments to be warmed.

The sub-chamber  $k$ , extending under the range, has a top plate forming the bottom plate of the range, and a bottom plate, through any suitable part of which openings are made to receive the cold air, the range standing on a suitable base-flange or upon suitable feet, so that cold air can pass under it and up. These are the hot-air flues, spaces, or chambers through which the cold air received at the bottom of the range passes and becomes heated by contact with the heat-radiating surfaces of the smoke-flues, which flues are arranged as follows:

The top of the fire-pot opens into the general flue and heating-space  $a^2$  under the front part of the boiler-plate, and between said plate and the top plates of the oven and the plates covering the hot-air-flue chambers.

This flue-space under the front part of the boiler-plate is separated from the rear flue-space  $b^2$  by a partition,  $c^2$ , and the flames and smoke pass around the ends of this partition into said space, heating the rear part of the boiler-plate and, by means thereof, the air in the warm-air box or chest over the rear part of the range.

The main volume of smoke and flame passes over the ovens into and down through vertical flues  $d^2$ , (one at the rear side of each oven,) each flue  $d^2$  opening into a flue,  $e^2$ , under the rear half of the oven, which flue  $e^2$  is separated from a flue,  $f^2$ , under the front part of the oven, by a partition,  $g^2$ , but opens into such flue  $f^2$  by an opening,  $h^2$ , at the front end of the partition.

Each flue  $f^2$  at its inner end opens, through a flue-hole,  $i^2$ , into a central horizontal flue,  $k^2$ , (the front part of which is provided with a central partition,  $l^2$ , to divide the space directly between two flue-holes,  $i^2$ ), and this bottom flue  $k^2$  at its rear end opens into the vertical flue  $q$ , which passes up through the rear part of the range-body and through the hot-air box  $s$ , and thence into the chimney.

The flues under the oven connect with vertical blind flues  $n^2$  or  $o^2$  at the inner end and one side of the oven, these flues being kept charged with the hot products of combustion by the displacement and circulation created by the presence and passage of the currents of smoke and flame through the main flues.

The continuous passage of the flame, smoke, &c., through the smoke-flues is as follows:

The fuel and flames heat the fire-pot and the heat radiated therefrom warms the air in the hot-air space on each side of and at the back of the fire-pot. The flames and smoke pass from the fire-pot into the flue-

space  $a^2$   $b^2$  and heat the pots placed on the boiler top and the plate  $t$ , and the heat radiated from the under surface of the plate heats the air in the adjacent air-chambers.

The flames and smoke pass down at the rear of the ovens and under the ovens through the flues  $e^2$   $f^2$ , (and indirectly into the blind oven-flues  $n^2$  or  $o^2$ ), and heat the ovens and the air in the air-chambers at the ends of and behind the ovens.

The flues around the ovens insure the heating of the ovens notwithstanding the currents of air passing around such flues.

The bottom flues heat the bottom plate of the range, (over the sub-air-chamber,) and thus the air in such sub-chamber becomes warmed and is prepared for contact with the hotter heat-radiating surfaces.

It will readily be seen that, by closing the hot-air distributing or outlet-pipe on either side of the range, absorption of the heat from the radiating-plates on the same side of the range by a current of air will be prevented, and the heat on said side may, therefore, be entirely utilized to heat the oven on said side, and that by closing both hot-air outlets all the heat from the fire-pot may be utilized for heating both ovens.

It will also be seen that in my arrangement of the fire-pot, ovens, and main hot-air spaces I embody them under one boiler-plate, and thereby secure an exceedingly compact and well-disposed system of cooking and air-heating chambers.

I claim—

1. The relative arrangement of the fire-pot  $b$ , one or more ovens,  $c$  and  $d$ , and one or more hot-air chambers or flues,  $l$ , the fire-pot, the oven or ovens, and the air-chamber or chambers being all in the same plane or under the same boiler-plate, and the hot-air chamber (or each hot-air chamber) being between the fire-pot and the adjacent oven, both having an inlet at its bottom and an outlet at its rear end, substantially as shown and described.

2. The fire-pot  $b$ , ovens  $c$   $d$ , and hot-air chambers or spaces arranged in a semi-cylindrical body, the fire-pot at the front, the ovens extending radially into the body, and the hot-air chambers or spaces surrounding the fire-pot and ovens, substantially as shown and described.

3. In combination with the fire-pot, ovens, and hot-air spaces, relatively arranged as described, the smoke-flues arranged with relation thereto, substantially as shown and described.

4. In combination with the fire-pot, smoke-flues, ovens, and hot-air chambers or passages, arranged as shown and described, the sub-chamber or hot-air space  $k$  beneath or in the bottom of the range, substantially as shown and described.

5. In combination with the fire-pot, ovens, hot-air spaces, and smoke-flues, the surmounting hot-air chest or box  $s$  at the rear of the range, and covering the rear part of the boiler-plate.

6. In combination with the hot-air spaces between the ovens, the central dividing-partition,  $m$ , substantially as shown and described.

GEO. W. WALKER.

Witnesses:

FRANCIS GOULD.  
S. B. KIDDER.