G. H. RUSSELL.

Stove.

No. 24,241. Patented May 31, 1859.

Fig. 1,

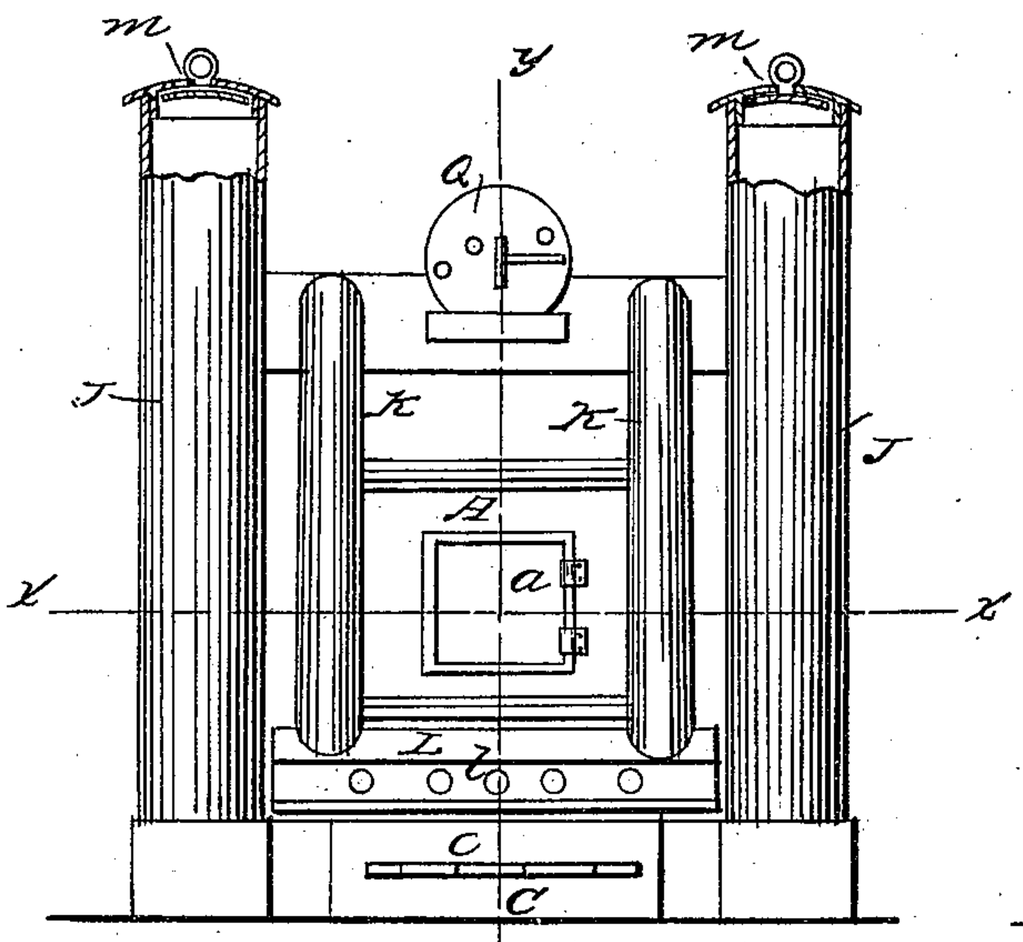


Fig. 4,

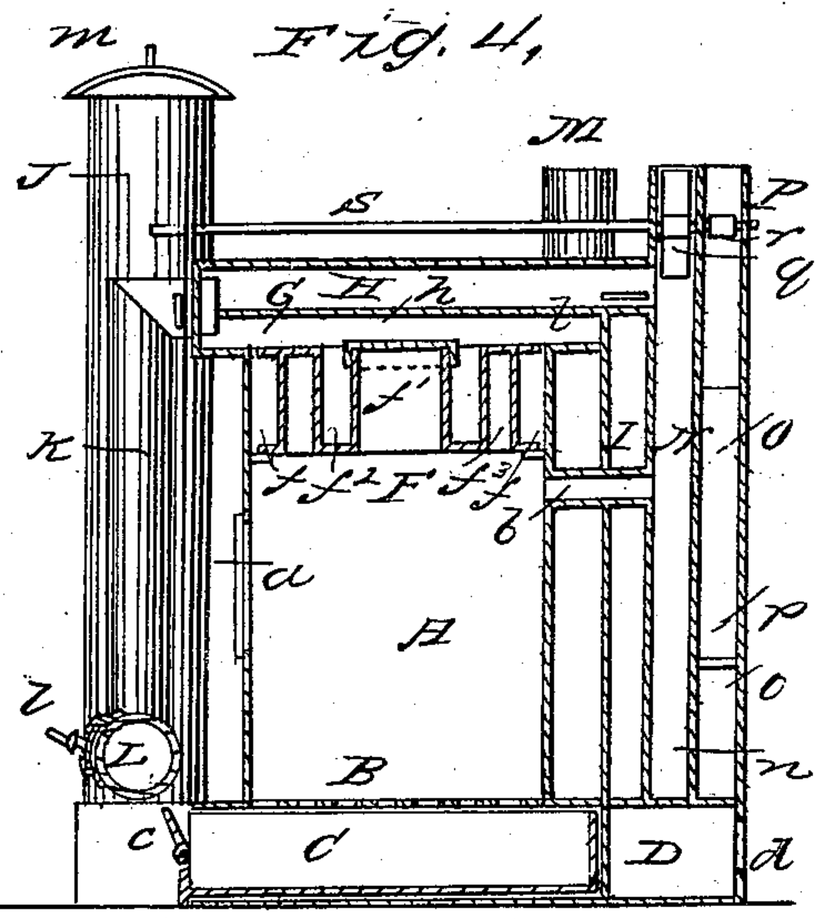


Fig. 2,

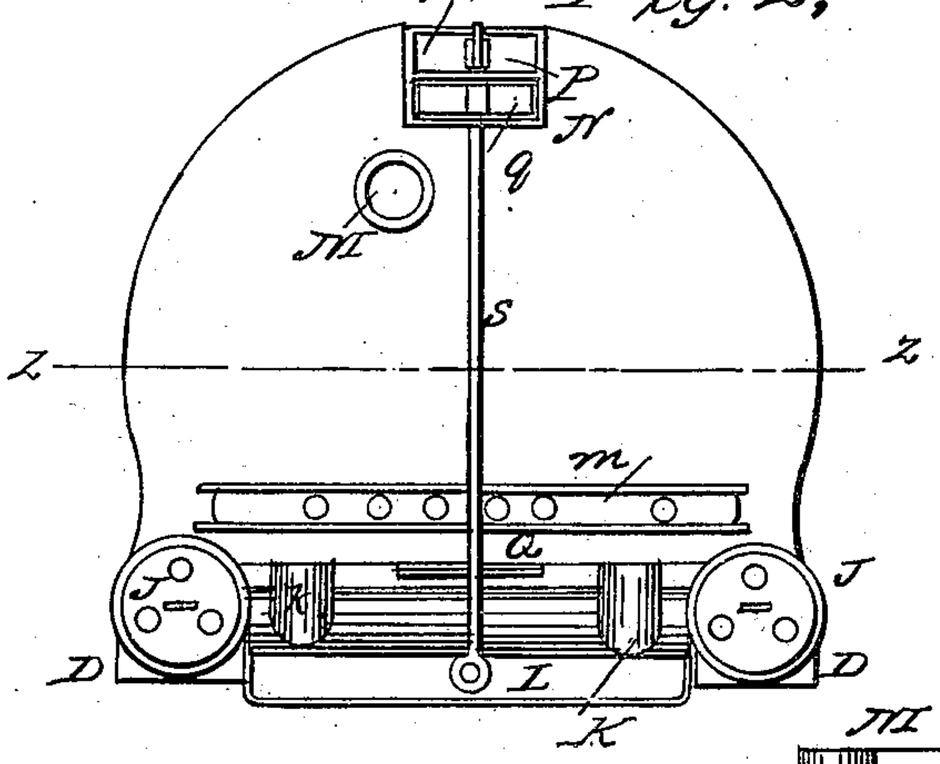


Fig. 3,

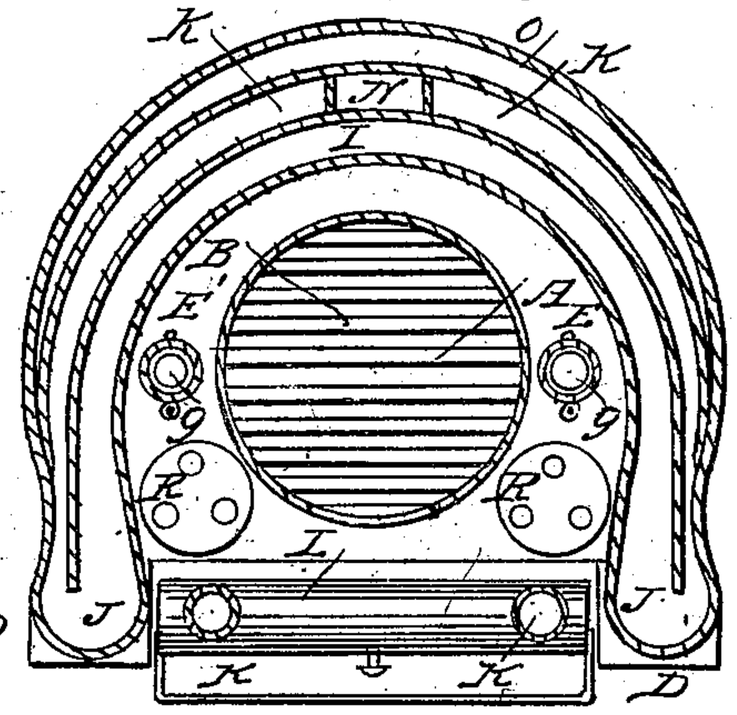
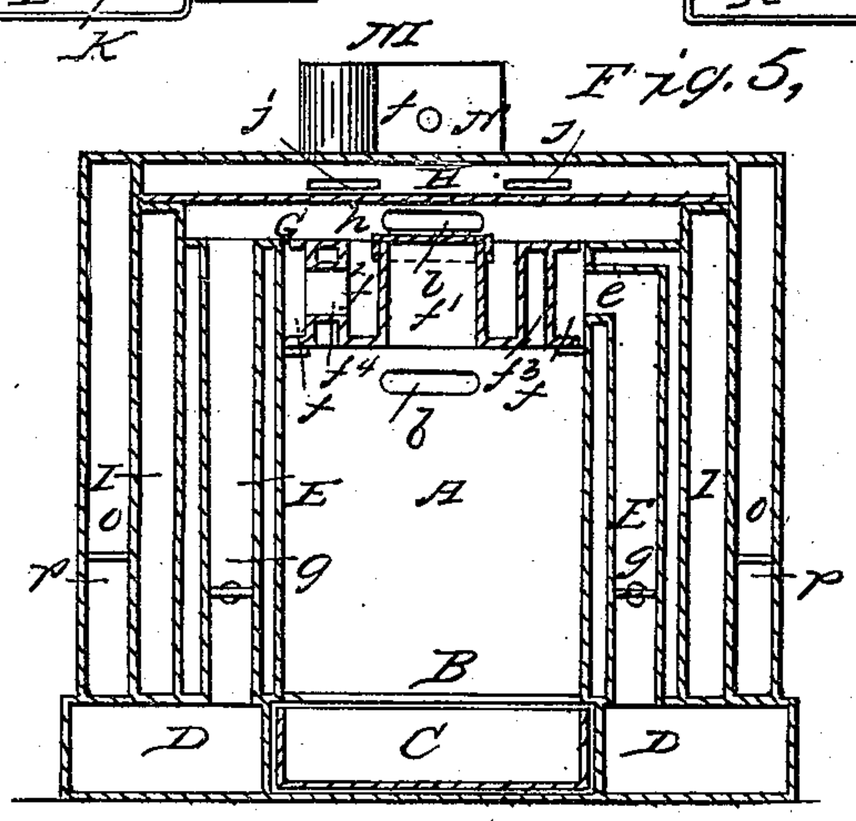


Fig. 5,



Witnesses:
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William C Amer

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE H. RUSSELL, OF BALTIMORE, MARYLAND.

STOVE.

Specification of Letters Patent No. 24,241, dated May 31, 1859.

To all whom it may concern:

Be it known that I, GEORGE H. RUSSELL, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and useful Improvement in Stoves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, represents a front elevation of the stove. Fig. 2, a top view thereof. Fig. 3, a horizontal section through the line *x*, *x*, in Fig. 1. Fig. 4, a vertical section through the line *y*, *y*, in Fig. 1, and Fig. 5, a vertical section through the line *z*, *z*, in Fig. 2.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my improvement consists in a novel arrangement and combination of air heating flues and smoke passages outside and more or less surrounding the fire pot or chamber, in connection with peculiarly disposed dampers, registers and ventilators; for securing the largest economy from a given amount of fuel with the most perfect control or management of the heat, from extreme hot to comparatively cold or any intermediate degree, in a quick and simple manner; also for warming an in-coming current of cold air and emitting it, free from noxious gases, at widely different points if desired; and for the better ventilation of the apartment; profitable employment of the heat contained in the smoke and escaping gases; and perfect regulation of the draft; the whole forming a most advantageous and novel arrangement, capable of presenting an ornamental exterior or face.

To enable others, skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

A, is the fire pot or chamber provided with a door *a*, in front and having its smoke escape *b*, in the rear near the top. B, the fire-bars or grate.

C, is the ash drawer made with a hinged partial front or door *c*.

Surrounding the sides and back of the ash drawer pit, is a cold air chamber D, supplied with air through an inlet *d*, in the rear.

On each side of the fire chamber is a vertical pipe E, E′, communicating at their lower ends with the cold air chamber D, of the base. The one E, of these pipes, has an elbow *e*, at top communicating with an annular space *f*, that surrounds a flanged fire pot cover or upper cylinder F, made to fit down within the chamber. The other E′, of these vertical side pipes opens at its top to a horizontal air chamber G, over the top of the cylindrical cover F, and beneath a cap plate H. Both of said pipes E, E′, are provided with dampers *g*.

The cylindrical cover F, which may rest upon side bricks in the fire chamber and be made removable at pleasure, consists of a series of concentric chambers commencing with the annular surrounding space *f*, and ending with a center drum *f*′, open at its bottom to the fire beneath and covered at its top by a lid or removable cap *h*. The intermediate concentric chambers of this cylindrical cover consist of annular spaces f^2, and f^3, the inside one f^2, of which is closed at its bottom but open at its top, while the outside one f^3, is open at its bottom and closed at its top. On the side of the surrounding annular space *f*, of this cover, opposite the side which has the elbow *e*, of the one vertical air pipe E, is a tube f^4, connecting said surrounding annular space, with the one concentric chamber f^2, which is open at its top, so that on opening the damper *g*, of that one E, of the vertical side pipes which has the elbow *e*, cold air, entering the base D, circulates round the ash drawer pit and partly or wholly at pleasure, passes up said one vertical side pipe E, through the elbow *e*, into and round the surrounding annular space *f*, which is heated by the hot air and fumes from the fire entering the one outside annular air chamber f^3, and from thence said air passes, in a partially heated state, through the connecting tube f^4, into the annular chamber f^2, which is heated by the fire on both of its sides, and from thence such air passes, highly heated, into the horizontal space G, above the cylindrical cover, from whence it may be distributed or circulated, as hereinafter described. The lid *h*, of the central drum *f*′, of said cover, may, if desired, be removed, to heat the air also in a direct manner, by the fire. The large accumulation or concentration of heat in and about this many chambered cylindrical cover F, will cause a strong draft or suction of all entering air in the cooler chambers leading thereto.

The one vertical side pipe E′, conducts the cold air direct from the base D, up into the horizontal space G, when the damper *g*, of said pipe is open, and which may be opened and the damper of the opposite side pipe closed, or such conditions of these two pipes that have so widely differing air heating duties, be reversed; or both dampers *g*, *g*, be closed or open; according to various requirements, and at the will of the attendant. The air thus admitted to the horizontal space G, passes off in its heated state through an aperture *i*, in the rear, into a chamber I, that encompasses the back and sides of the fire chamber portion and that communicates with two large and tall vertical pipes J, J, in front, provided with registers on top to distribute the heated air; or, by closing said registers, the hot air instead of being emitted at the top of these pipes is caused to traverse back around in an outer air surrounding drum or chamber K, and from thence is passed, by outlets *j*, *j*, over the top of the horizontal inner cap plate H, and from thence down front pipes *k*, *k*, to a foot warming contrivance L, at the bottom of the stove in front, provided with a register *l*. Or, said heated air, may be passed from the horizontal space G, direct into the apartment, by opening a top register *m*; or, it may be conveyed to an upper room by means of a pipe M, or it may escape in all or any of the several ways named, thus giving a capacity of adjustment to suit every possible requirement.

The smoke escape pipe *b*, extends from the fire chamber through the one outside air surrounding chamber I, to the adjoining outside air drum or chamber K, which latter is divided at the rear by a vertical flue N, for the smoke and escaping gases to pass off without coming in contact with the air in said outside chamber K. Below the smoke entry *b*, into the vertical smoke flue N, in the back portion of the outer air drum or rear side of said vertical flue, is another smoke escape *n*, that communicates with the external drum or chamber O, of all. This external drum O, has a horizontal partition *p*, above the last named smoke escape, extending to within a short distance of the front of said drum at either end, thus dividing the drum into an upper and lower chamber, with the former of which only a second smoke pipe or vertical flue P, is connected.

In the two vertical smoke flues N, and P, are dampers *q*, *r*, affixed to a rod *s*, that is arranged across the top of the stove and connected with an index Q, in front. These dampers *q*, *r*, are so set on the rod *s*, that on turning the rod to the right, the one damper closes the flue it controls, while the other damper opens its flue, and on turning the rod *s*, to the left, the opening and closing action of the dampers to their flues is reversed. The index Q, serves to show which damper is open and which one is closed.

Supposing the damper *q*, to be open and the damper *r*, to be closed, the smoke passes off direct from and up the inside vertical flue N, but, supposing the damper *q*, to be closed, and the damper *r*, open, then the smoke is emitted through the lower orifice *n*, into the external drum O and passes around the lower portion of the outside air drum K, up again in front and back around the upper portion of said air drum and above the division plate *p*, to and up the back vertical flue P. When the smoke and escaping gases are made to take the latter course, it will be seen, that a deal of heat, otherwise lost, is economized by the heat contained in the smoke and escaping gases or products acting on the outer air drum K, also by such heat causing the external drum O, to radiate more heat. Such double regulation of the smoke discharge—direct and indirect—is also of service in controlling the draught.

The passages which convey the smoke inside the stove, being situated so that they become considerably heated, assist in keeping up the current of air through the outer air chamber.

The cold air chamber or base D, is provided at the top in front, and in contiguous relationship to the fire chamber or drum, with registers R, R, that, on being opened, serve to cause a quick draught of air out of the cold air chamber into the apartment and in close proximity to the hot portions of the stove, so as to cool the latter when too hot, and for the purpose of ventilating the apartment and thereby contributing to health, comfort and convenience.

It will readily be seen, from the foregoing description, how and by what regulation of the dampers and registers, the stove may be made to produce very great heat or, with the same fire, but very little (comparative cold), or a moderate degree of heat at pleasure; and that such changes may be rapidly effected. It will likewise be seen, how convenient the arrangements are for distributing the heated air high or low and at widely different points, free from smoke or gas; and that the heat which is derived from the fire drum, hot air chambers, smoke flues, and from the large amount of radiating surface, is under the most perfect management, thereby making the stove suit either a large or small apartment, and making it most economical to use.

Such stove may be variously situated, but I prefer to set the rear portion of it in the chimney and have the exterior or front portion project out into the room, and the ornamental style of its construction, though no ornaments may be on its surface, will sug-

gest it occupying such advantageous position.

What I claim as my invention and desire to secure by Letters Patent, is—

The combination, with the inner fire drum A, of the cold air base D; vertical side pipes E, E′, and elbow *e*, with their dampers *g*, *g*, cylindrical cover or top drum F, with its chambers *f*, *f′*, *f²*, *f³*, and connecting tube *f⁴*; horizontal air space G, and outlet *i*, outer air drums I, K; passages *j*, *j*, front vertical register pipes J, J; foot warmer connecting pipes *k*, *k*, and foot warmer L, with its register *l*; ventilating registers R, R; double smoke pipes, N, *n* P, *p* with dampers set as described, and divided outer smoke drum O, with its passage or passages, substantially as and for the purposes set forth.

GEORGE H. RUSSELL.

Witnesses:

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WILLIAM H. ARMOR.