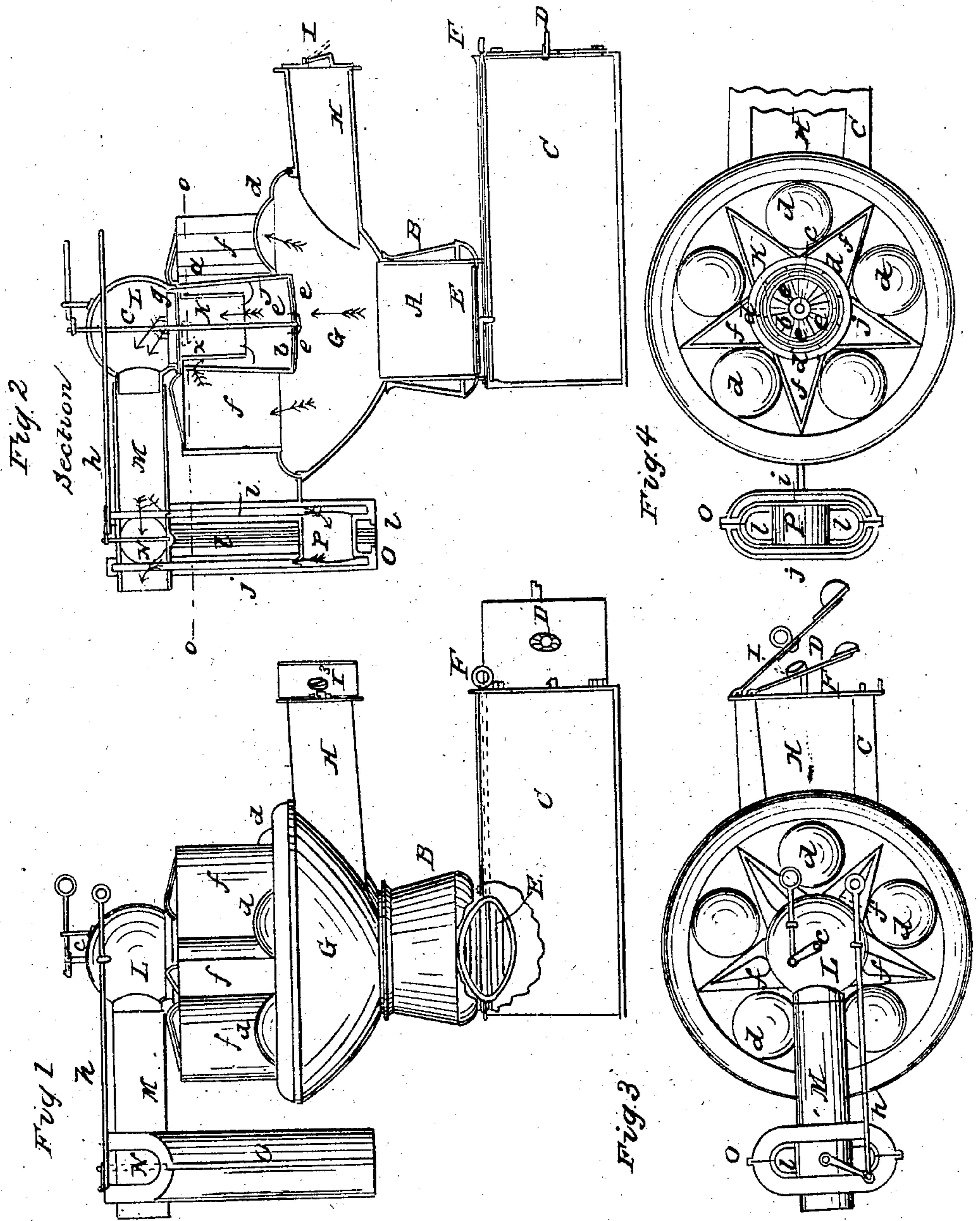


J. C. TREAT.
Hot-Air Furnace.

No. 8,276.

Patented Aug. 5, 1851.



UNITED STATES PATENT OFFICE.

JOS. C. TREAT, OF EAST HARTFORD, CONNECTICUT.

HOT-AIR FURNACE.

Specification of Letters Patent No. 8,276, dated August 5, 1851.

To all whom it may concern:

Be it known that I, JOSEPH C. TREAT, of East Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hot-Air Furnaces for Heating and Ventilating Rooms or Buildings; 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 part of this specification, in which—

Figure 1, is a side elevation with part broken away to exhibit the swivel fire grate. Fig. 2, is a longitudinal section. Fig. 3, is a plan, and Fig. 4 is a sectional plan taken in direction of the line *o, o*, Fig. 2.

The same letters of reference denote similar parts throughout the several figures.

The nature of my invention consists in the employment of a suitable fire-pot provided with a swivel grate for clearing out, and communicating with a fire chamber, which by raised and projecting surfaces, acts as a distributor, and the flue from which, by a suitably constructed valve, and by the employment of appropriate passages, serves either to throw the draft in a direct line, or to divert it and cause the flame or heated air to dip down the flue connected with the fire chamber and enter up through an internal flue and so on to the branch carrying off flue.

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

A, is the fire pot which may be lined with soapstone, fire brick or other suitable material, it is surrounded by an ornamental outer radiating case B, and C, is an ash pit, having a register D, in its door for admitting air.

E, is a swivel fire grate, or series of bars, being operated by a rod F, passing through the ash pit, and when carrying fuel the bars are in a horizontal plane as in Fig. 2, but when clearing or discharging the fire they may be made to swivel and to approach a vertical position as shown in Fig. 1.

G, is a fire chamber and H, the feed flue which in its door is provided with a valve I, opening outward to admit air and prevent explosion from generation of gas which frequently occurs when the fire is first lit.

J, is the smoke pipe or flue rising from the fire chamber G, and containing an internal smaller and shorter flue K, which leaves an

annular space between it and the flue J, that is covered in at the top by a flange on the flue K; the flue or chamber J, is provided near its top with apertures *a, a, a*, and has a valve *b*, at its bottom operated by a vertical spindle *c* so as to close or open the bottom of the flue J, which has apertures *e, e, e*, closed or opened by the arms forming the valve *b*, which is worked with a reciprocating circular movement, being similar to an ordinary register, (or any other form of valve may be used). The upper plate of the fire chamber G, is studded with spherical projections *d, d, d* for radiating heat, and has hollow upright angular projections *f, f, f*, (constituting in appearance a star form) surrounding the flue J, with which they communicate by the apertures *a, a, a*, and are closed at the top and open at the bottom to the fire chamber G, and serving as flues when the draught is diverted and for distribution of heat. The internal flue K, of less length than the outer chamber or flue J is open, top and bottom having a cross tie *g*, or narrow strip for carrying the spindle *c*, and it freely communicates with the globular radiator L, at the end of the branch M, (leading to the chimney) which is provided with a throttle valve N, operating as a damper but more particularly to shut or open the branch M, being worked by the rod N, and being situated between passages *i, j*, of a radiator O, which may be made in two parts, forming vertical channels or flues by the passages *i, j*, which are prevented from meeting by small partition projections (seen in Fig. 4) running the depth of the radiator, the flues *i, j*, being carried around the branch M, on either side of the throttle valve and which being closed in also at their bottom are made to communicate with each other by a short branch P, situated near the bottom of the radiator O, which it will be seen has an open space *l, l*, centrally through its whole length.

The several parts of the furnace may be constructed of metal or any suitable material and should be fixed in a suitable air chamber provided with appropriate air inlets and outlets.

The operation in further description is as follows: When first lighting the furnace, or when only a direct draft is required, either for the purposes of ventilation during warm weather, or for the procurement of a moderate heat only; the valves *b*, and

N, are thrown open, thereby causing the flame or hot air and smoke, to pass off through the apertures *e, e, e*, entering the flue J, up through the internal flue K, and soon direct along the branch M, to the chimney as shown by arrows in red Fig. 2. But when a great heat is required and the furnace is intended to warm the air of the chamber in which it is situate (and from which branches to convey the heat may be attached) the valves *b* and N, are closed, thereby diverting the draft as shown by arrows in blue Fig. 2, the flame or hot air and smoke entering the angular projections *f, f, f*, and from them through the apertures *a, a, a*, dipping down the flue J, and passing up through the internal flue K, along the branch M, where the valve N, (being closed or occupying the position shown by red dotted lines Fig. 1) intercepts the draft and causes it to be diverted, the hot air and smoke passing down the flue *i*, of the radiator O, and by branch P, up the flue *j*, and soon again entering the branch M, on the other side of the throttle valve N, communicating with the chimney.

The diversion of the draft as described, by closing the valves *b* and N, causes the hot air and smoke, by their detention and course, to heat the several distributing sur-

faces and projections described, the radiator O, by the position of its flues and its proximity to the fire will induce a current of air to flow up the space *l, l*, and thus by the combination as shown, a large amount of heat generated, will be imparted as desired, while, the dip caused in the diversion of the draft by closing the valve *b*, will occasion any floating particles of fuel to be deposited at the bottom of the flue J, and on the valve *b*, which by opening and closing a few times, will deliver the deposited ash through the openings *e, e, e*, to the fire, so that the effect of the dip as described will not only cause more heat to be absorbed and radiated, but also keep the draft clear by obviating the lodgement of particles in the flues.

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

The employment of a flue or chamber J, having a valve *b*, and apertures *a, a, a*, in combination with an internal flue K, constructed and operating substantially as shown and described for the purposes set forth.

JOSEPH C. TREAT.

Witnesses:

CHAS. C. ASHLEY,
G. T. PERSONS.