(No Model.)

J. J. RICHARDSON.

FURNACE.

No. 489,758. Patented Jan. 10, 1893.

Fig. I.

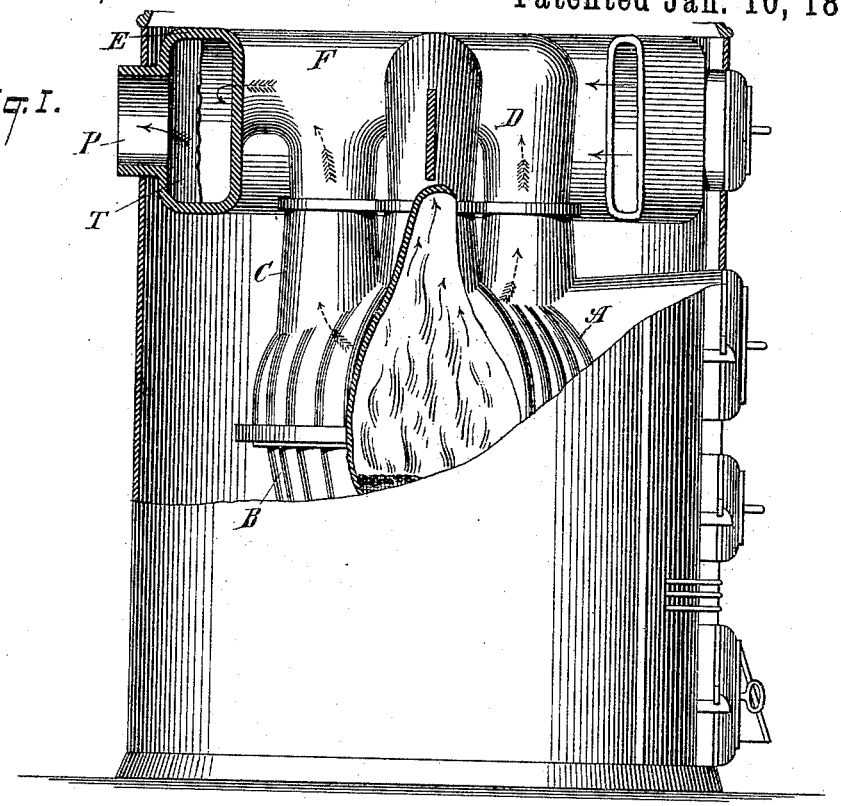
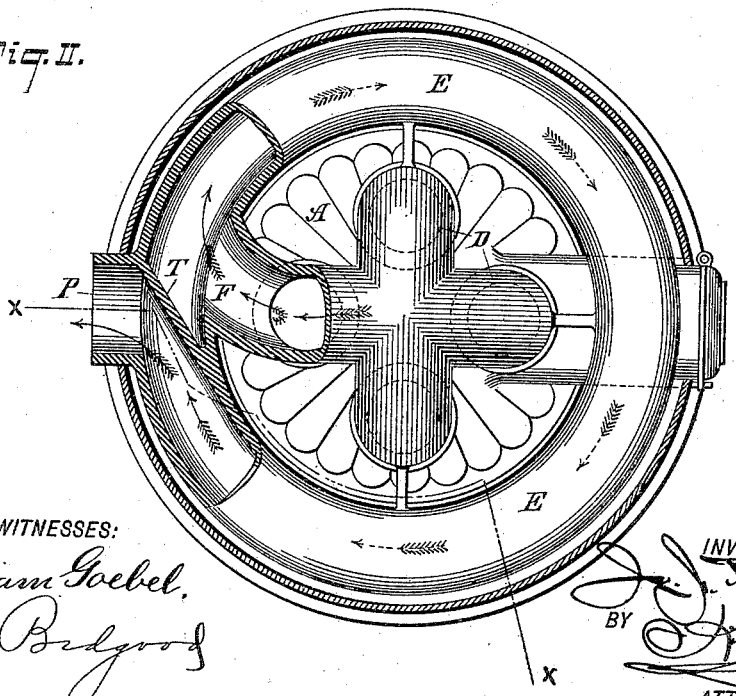


Fig. II.



WITNESSES:

William Goebel.

M. V. Bedgood

INVENTOR

J. J. Richardson

BY Knight Bros

ATTORNEYS

UNITED STATES PATENT OFFICE.

JEREMIAH J. RICHARDSON, OF NEW YORK, N. Y.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 489,758, dated January 10, 1893.

Application filed April 5, 1892. Serial No. 427,921. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH J. RICHARDSON, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

My invention consists broadly in the construction of a furnace radiator made, or cast, preferably, in one piece without joints of any kind, or otherwise; having the central portion where it sits on the dome constructed of four or more pipes, or legs, coming to one common center, or pipe on top, which extends into and forms part of the outside oval or round radiator: said legs, or pipes, being formed, preferably, round where they sit on the dome of the furnace and also where they come to a common center. This center is so formed, or raised, on the inside as to leave no place for deposit of ashes or soot and to be practically self-clearing. That is to say, the central meeting point of the four pipes is raised sufficiently to form a sloping surface, outwardly and downwardly in all directions.

The center portion of my radiator is so constructed as to turn into the outside portion in an easy curve, fashioned something like a round elbow. This form, allows the products of combustion to pass readily to the outside portion, through which it makes a complete circuit before it reaches the exit to the chimney.

The outside portion of the radiator is made round or oval, and is arranged with a division plate next to the exit pipe so as to direct the outflowing products of combustion in the outside radiator in such a manner that they are compelled to make a complete circuit of said radiator before escaping to the chimney. The said radiator is so constructed that products of combustion have to pass up into, through and around in said radiator, and are impinged perfectly against all its surface, making every inch of internal surface of this radiator exposed to the direct action of the flame and heated gases of combustion, while the inflowing air is forced over and through the radiator in such a manner that every inch of external surface is reached and thus securing an active and effective radiating surface.

The radiator is adapted to retard the escaping products of combustion until all the available heat is absorbed.

In the accompanying drawings which form a part of this specification Figure I represents a side elevation of my improved furnace, a portion being cut away to show the internal parts, said cut away portion being on the line X—X Fig. II. Fig. II is a top view of the furnace with certain portions removed so as to expose the interior parts of the radiator.

In the drawings A represents a dome seating upon the fire box B as shown in Fig. I. The dome A terminates at its upper end in four discharge tubes C. These four discharge tubes are arranged at right angles to each other, one in the front, one in the rear and one at each side, at equal distances from each other. Upon these discharge tubes C rest the four legs D that form the center of the radiator E. These supporting legs D, fit over and on top of the discharge tubes C and correspond in number and in position therewith.

The radiator E is rounded above and below having no corners or sharp angles of any kind and begins at the discharge at the rear of the crown flue F and extends from said point all the way around the furnace and finally discharges into the exit pipe P at the rear of the furnace so that all the products of combustion after entering the radiator will by reason of the division plate T be conducted all of the way around said radiator and the contained heat will be utilized to the fullest extent as every particle is bound to impinge upon the surfaces of the radiator at one or more points.

The division plate or partition T is provided for cutting off the direct flow of the products of combustion as they leave the crown flue F. The sides of this exit flue are rounded so as not to impair the draft as the products of combustion flow into the radiator E. The partition T also extends in a slanting direction across the radiator E thus serving as an additional means of guidance and causing an acceleration of the draft at a point where it would be otherwise more or less choked and impeded if compelled to suddenly change its course. The said division plate by reason of its slanting direction, operates so that products of combustion when passing through the center of the radiator to the outside section, pass away from it, rather

than against it, on both sides, making it practically indestructible.

The combined area of the four or more pipes, or legs D, is but a trifle larger than the area of the smoke pipe, or exit to the chimney P while the area inside of the outside section E of radiator bears the same relation in size to the smoke pipe, or exit, as the legs, or center sections: my object being to more perfectly force the products of combustion against the rounding surface and to so fill them at all times that there shall be a comparatively small loss of heat into the chimney. On the other hand, the radiator is so constructed that all the inflowing fresh air is forced to pass over the exterior of these castings and to easily reach and cover every inch of surface naturally, so that practically there is no waste surface, as there are no sharp angles to deflect the heat away from these surfaces. The inflowing air so clings to these rounding surfaces as it passes up and through the furnace that it makes it almost impossible to overheat them; making the furnace, constructed in this way, much more desirable and durable. I claim, also, for this radiator a complete upward and circulatory motion being given the products of combustion into, through and around the main radiator in the most perfect and natural manner.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:—

1. The radiator E having rounded exterior surfaces above, below and at the sides in combination with the centrally located pipes or legs D and the crown flue F connecting the said pipes D with the radiator E as and for the purposes set forth.

2. The combination of radiator E having plate or partition T, the crown flue F, the legs or pipes D and the dome A having the discharge tubes C, as and for the purposes set forth.

JEREMIAH J. RICHARDSON.

Witnesses:
WM. J. DUNN,
FREDERICK KOCH.