

JOHN H. BURTIS.

Improvement in Hot-Air Furnaces.

No. 115,699. *Fig. 1.*

Patented June 6, 1871.

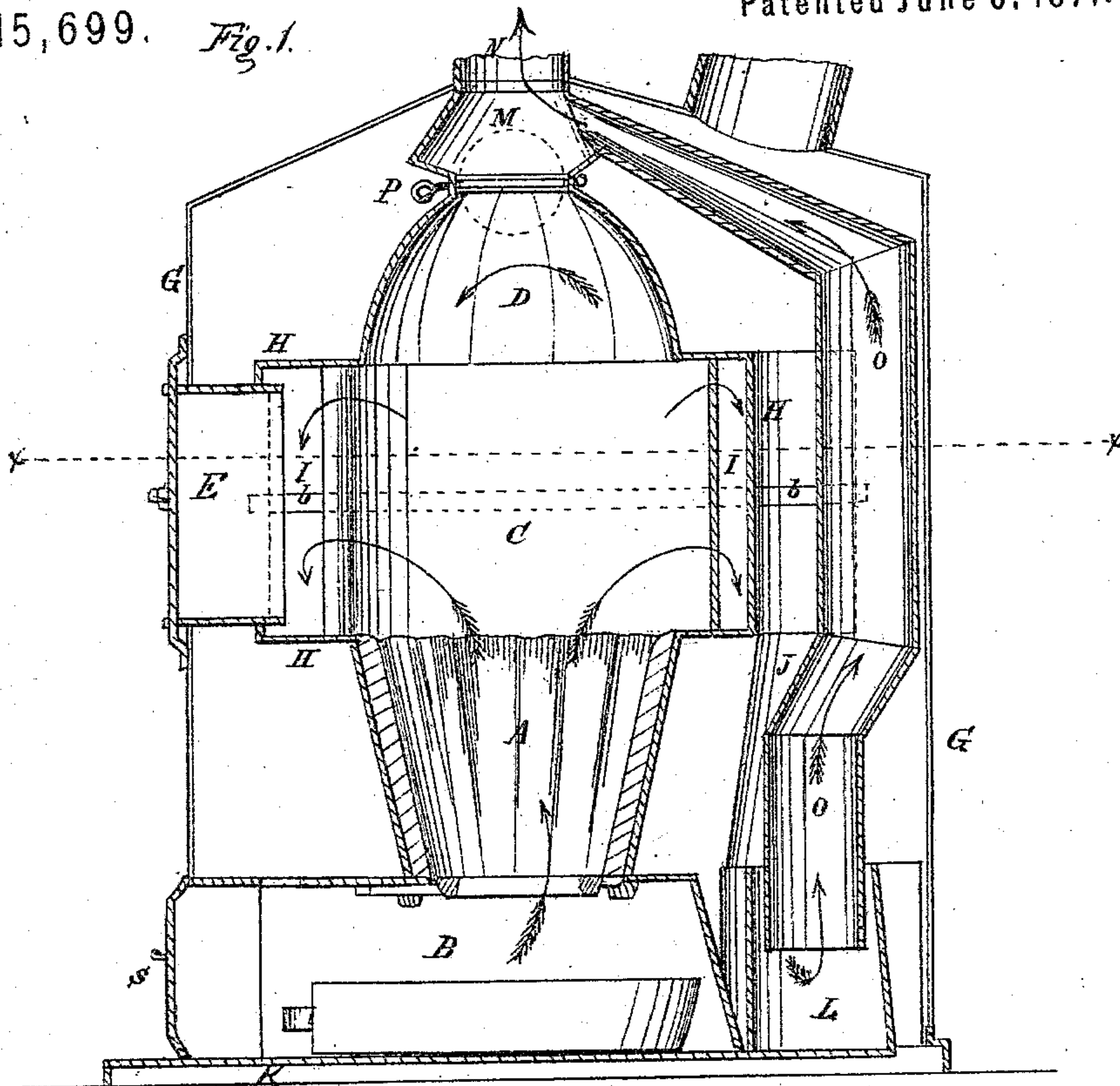
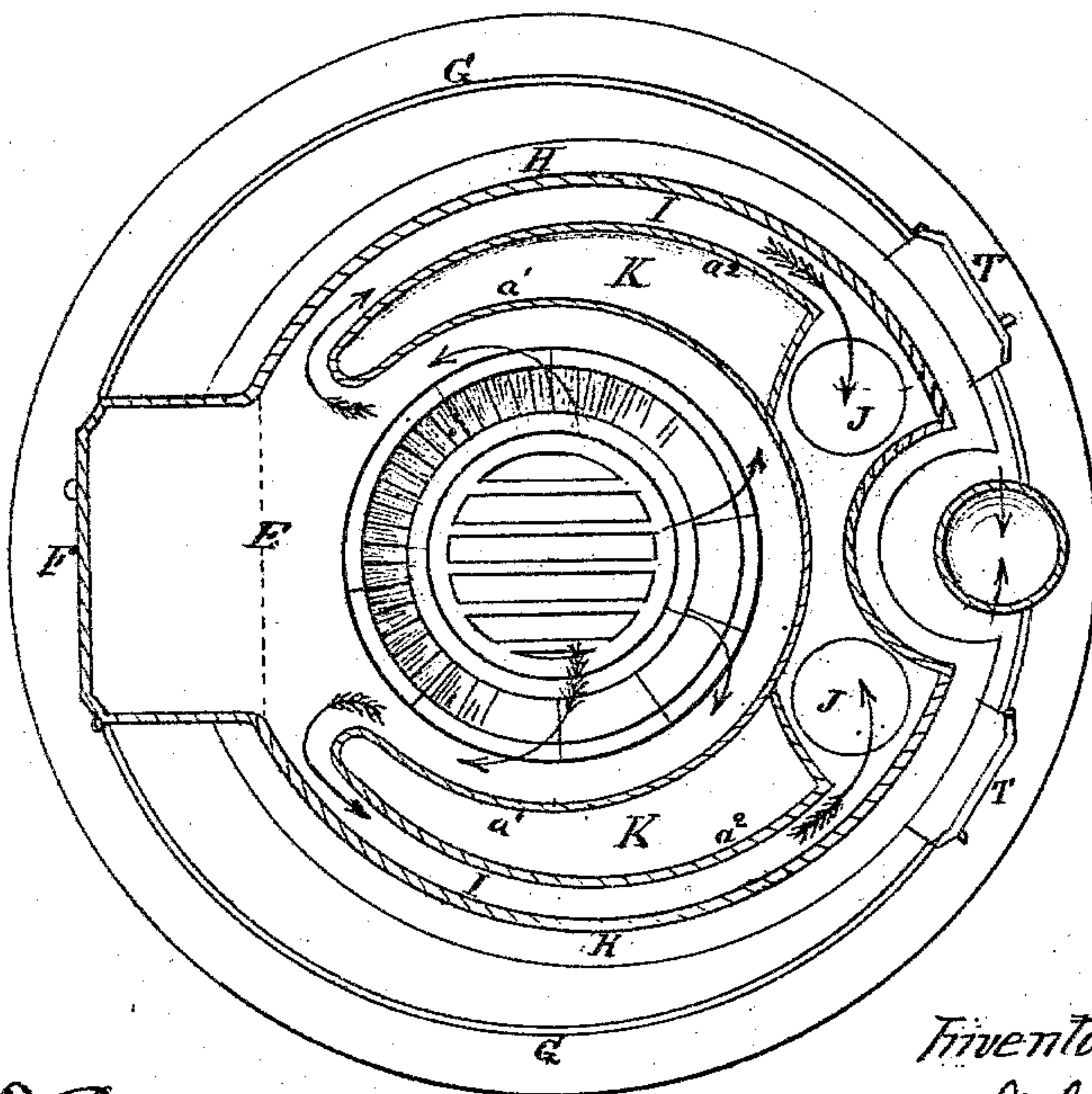


Fig. 2.



Witnesses:
Charles A. Randall
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Inventor:
John H. Burtis.
Per Charles Fraser & Co. good
attys.

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Fig. 3.

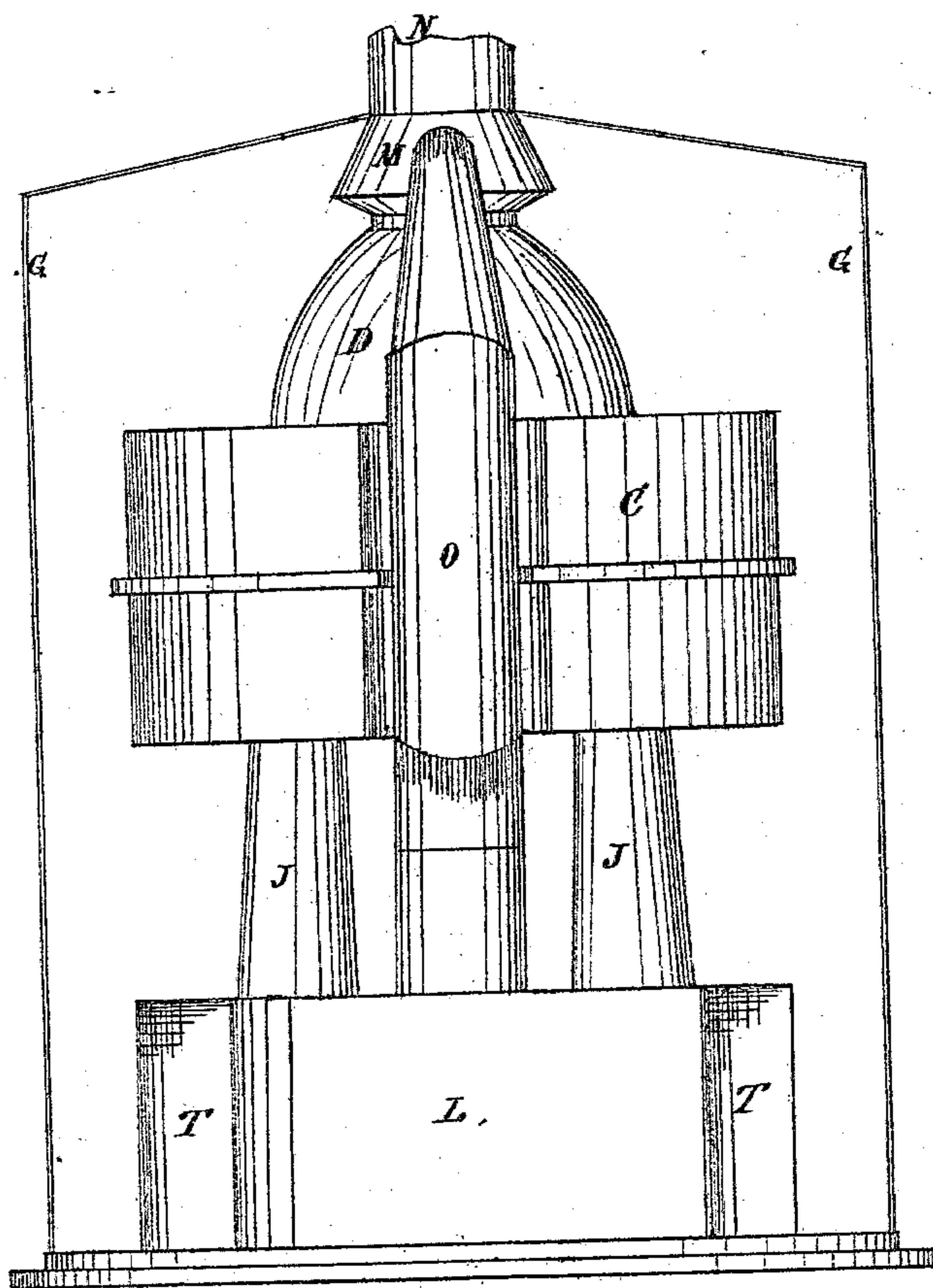
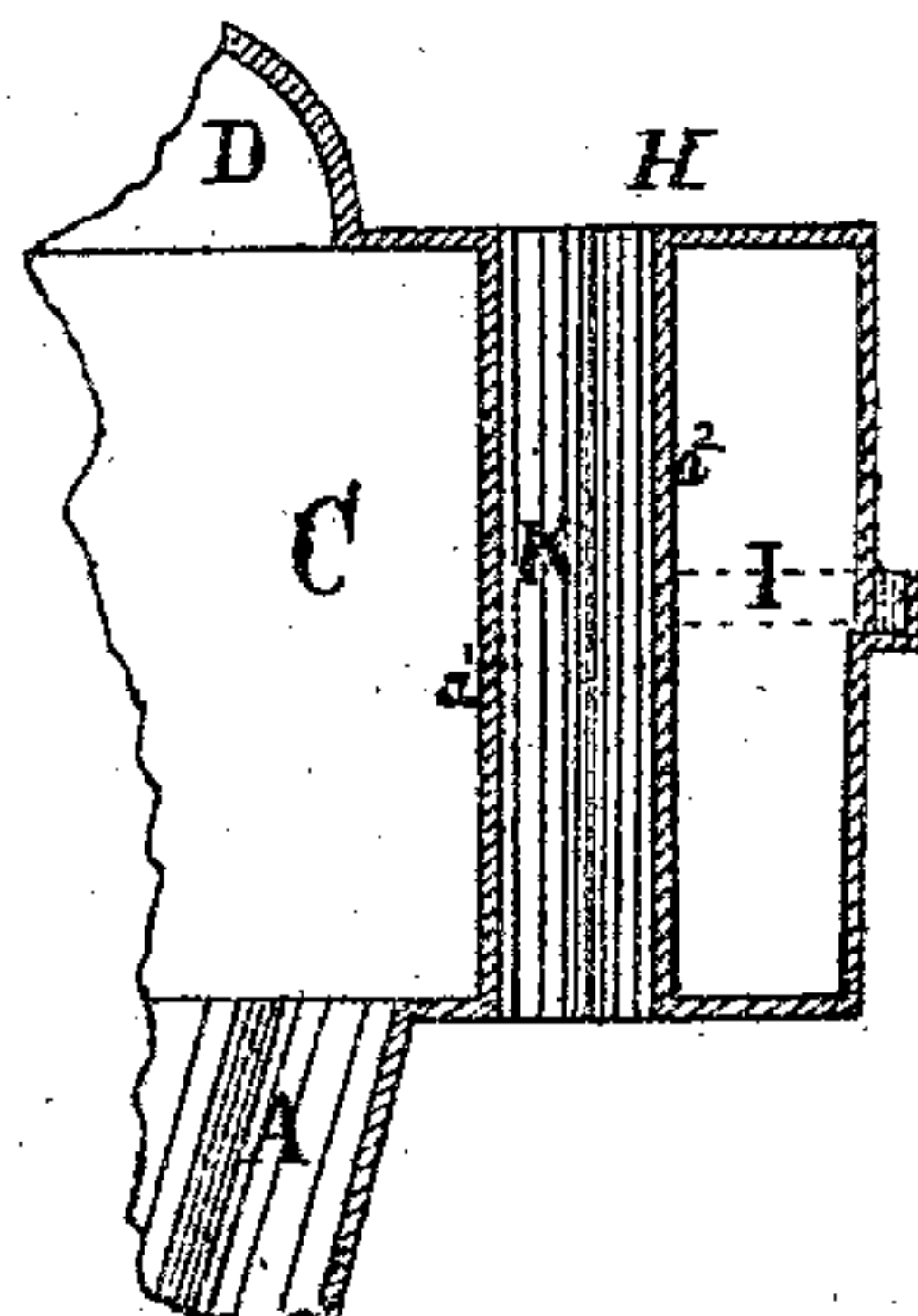


Fig. 4.



UNITED STATES PATENT OFFICE.

JOHN H. BURTIS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 115,699, dated June 6, 1871.

I, JOHN H. BURTIS, of Brooklyn, in the county of Kings and State of New York, have invented an Improved Hot-Air Furnace, of which the following is a specification:

The object of my invention is to increase the extent of radiating surface and retain a compact and simple form, and to so construct the parts that they are connected by none but horizontal joints; and it consists in an enlarged drum or cylinder surrounding the combustion-chamber, with intervening air-passages on each side, said drum forming horizontal flues for conveying the gaseous products of combustion in two equal volumes from the front to the rear; in the employment of a dome-shaped top to the combustion-chamber, which communicates with the smoke-pipe by the opening of a damper therein; and also in a supplementary heating-chamber above the dome.

As represented in the drawing, Figure 1 is a sectional elevation; Fig. 2, a horizontal section on the line *x x*, Fig. 1; and Fig. 3 is a rear elevation with the casing in section, showing the flues *J J*, which convey the products from the flues *I I* to the base chamber *L* and smoke-pipe *O*. Fig. 4 is a vertical section of a portion of the drum and combustion-chamber, showing one of the air-passages in its relation to the adjacent parts.

The fire-pot *A* has underneath it an ash-chamber, *B*, and is provided with a grate of any suitable form. Directly over the fire-pot is a combustion-chamber, *C*, of a larger diameter than that of the fire-pot, and surmounted by the concave dome *D*. In the front side of the combustion-chamber is the passage *E*, which communicates with the door *F* in the outer case *G G*, for the introduction of fuel. The combustion-chamber *C* is surrounded by a drum or cylinder, *H H*, which contains the horizontal flue-passages *I I* and the vertical air-passages *K K*. The former carry the products of combustion in two equal columns from the front to the rear part, as indicated by the arrows, where they descend the downward flues *J J* into the chamber *L*, situated in the

rear portion of the base. From this chamber the smoke-pipe *O* starts (beginning near the bottom in order to force the heated products to the lowest point) and ascends outside of the dome *H*, inclining inward above the dome *D*, where it unites with the supplemental chamber *M*. With the top of the latter the main smoke-pipe *N* is connected, which communicates with the chimney. The dome of the combustion-chamber and the supplemental chamber *M* are separated by the damper *P*, which is kept closed, except in starting the fire, when it is opened to give a direct draft.

The flame and gases of combustion ascend and circulate around the dome *D* before finding egress through the flues *I I*, thus heating a large area of radiating surface directly exposed to the air contained within the heating-chamber or inclosing-case *G G*, the surface so heated comprising not only the exterior wall of the fire-pot, but the outer sides of the combustion-chamber *a*¹ and the interior surfaces *a*² of the flues *I I*, (between which the air circulates in the passages *K K*), as well as the exterior surface of the entire drum *H*, downward flues *J J*, chamber *L*, smoke-pipe *O*, and supplementary chamber *M*.

By means of this large amount of radiating surface efficient heating capacity is obtained with a moderate fire, by which the vitality of the air is not destroyed by subjecting it to too high a temperature.

The parts are so constructed as to be fitted with horizontal joints only, the combustion-chamber and its adjuncts having a single joint, *b b*, and the bends or elbows of the pipes being cast entire, so that absolutely-tight fitting of that part is rendered an easy matter, and deleterious gases are prevented from mingling with the air heated.

The furnace is equally well adapted for setting in brick-walls or sheet-metal casing. The cold air may be admitted underneath the bottom plate *R*, or in any other convenient manner.

Access to the ash-chamber is had by the

door S, and dust-deposits from the flue-passages are removed through the doors T T from the chamber L.

I claim as my invention—

1. The combination, with the combustion-chamber C, of the drum H, provided with the vertical air-passages K K and horizontal flues I I, substantially as set forth.

2. In combination therewith, the downward flue-passages J J, supplementary chamber L, and smoke-pipe O, arranged and operating substantially as set forth.

JOHN H. BURTIS.

Witnesses:

KATE N. JONES,

WHEELER W. PHILLIPS.