2 Sheets—Sheet 1.

J. P. HAYES.

Hot Air Furnace.

No. 6,201.

Patented March 20, 1849.

Fig. 3

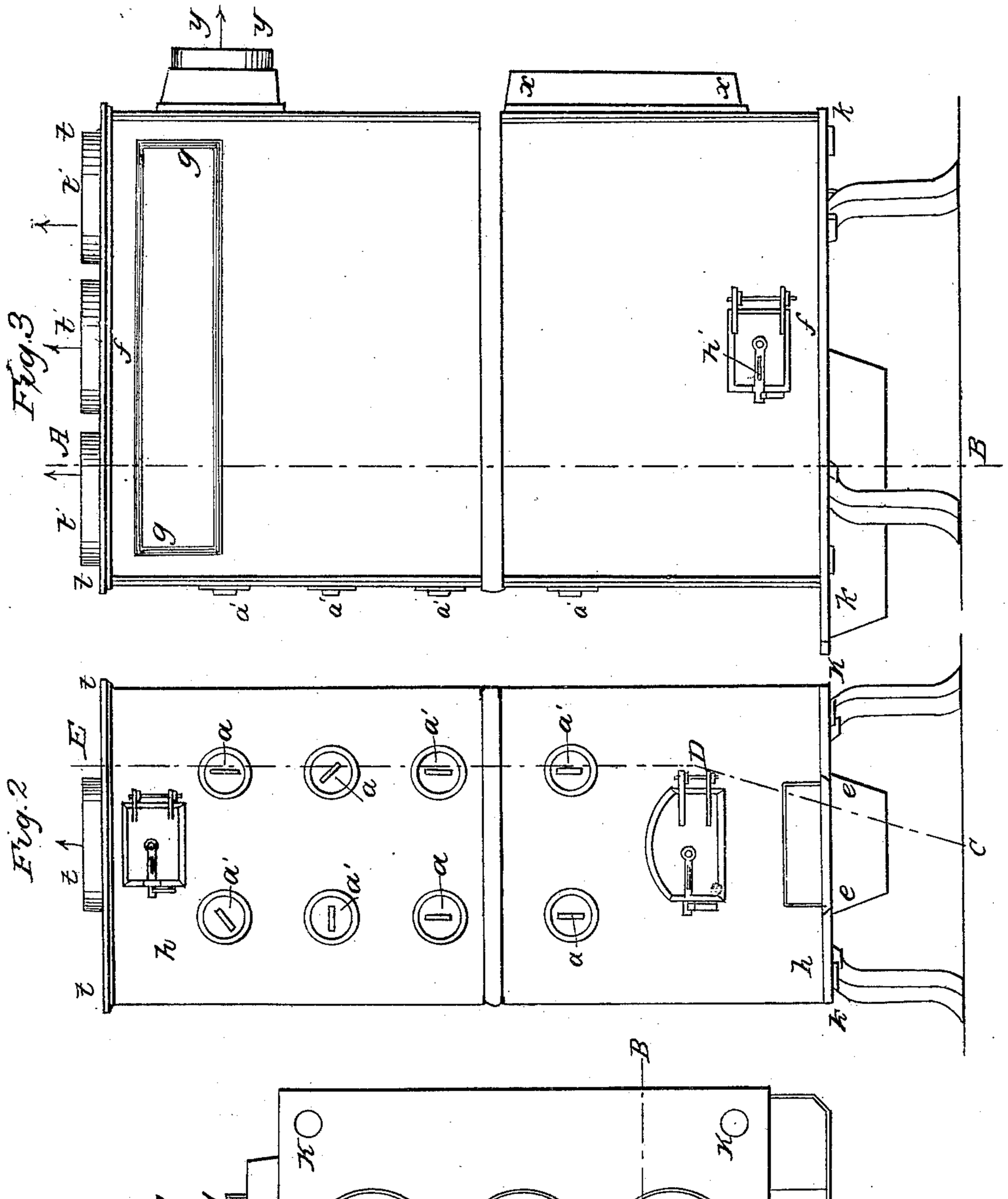
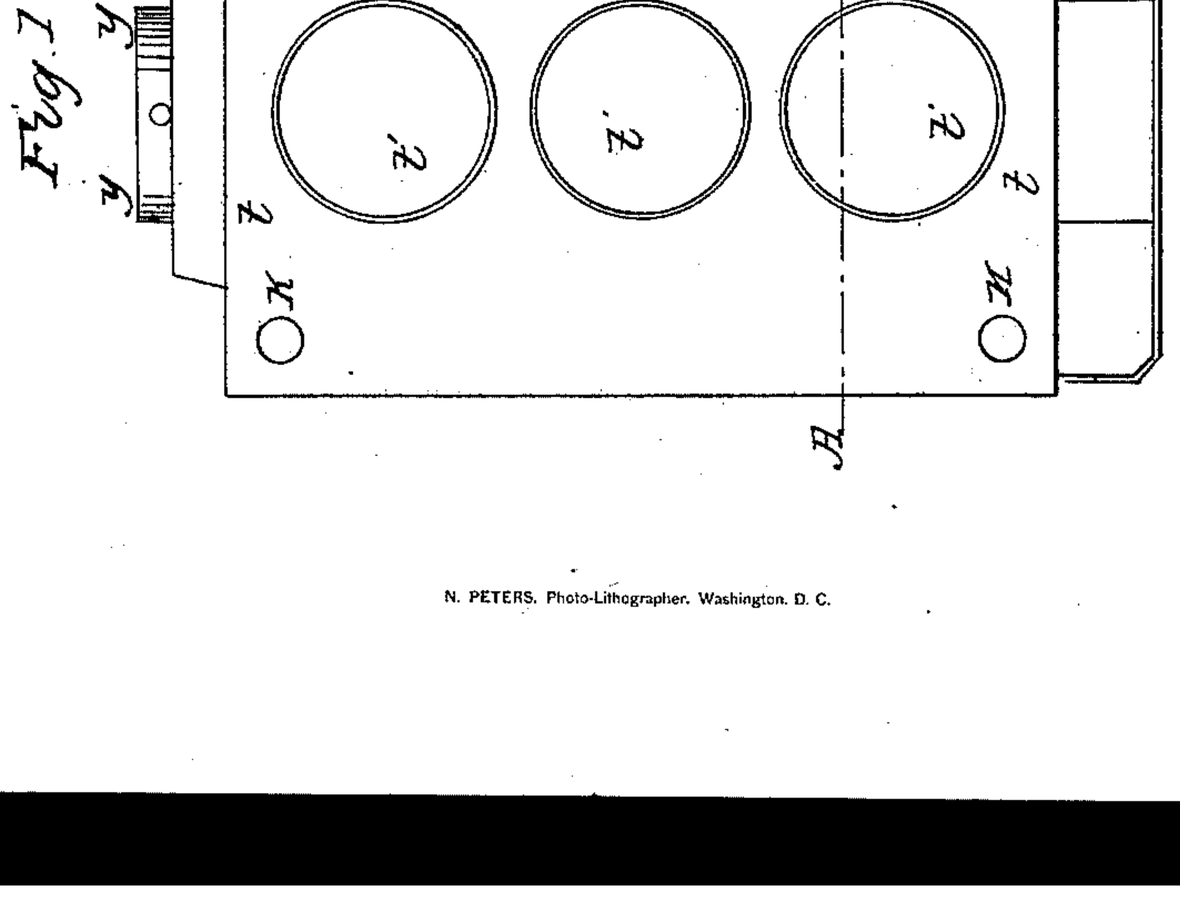


Fig. 2

Fig. 1



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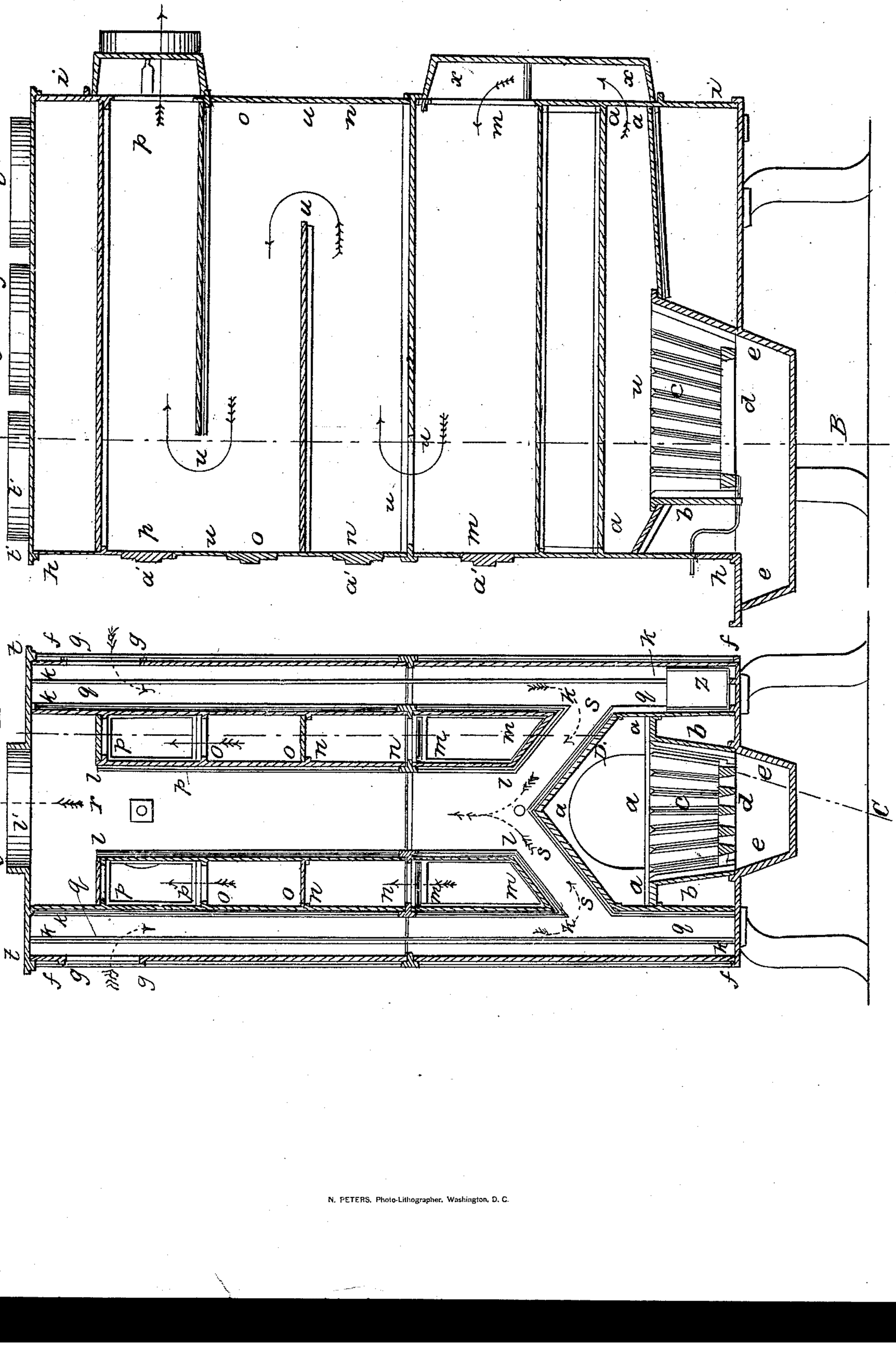

UNITED STATES PATENT OFFICE.

JNO. P. HAYES, OF BOSTON, MASSACHUSETTS.

PORTABLE HOT-AIR FURNACE.

Specification of Letters Patent No. 6,201, dated March 20, 1849.

To all whom it may concern:

Be it known that I, JOHN P. HAYES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Portable Hot-Air Furnaces, and that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent the construction of my improved portable furnace.

Figure 1 is a plan. Fig. 2 is a front elevation. Fig. 3 is a side elevation. Fig. 4 is a vertical section taken in the plane of the line A—B, Figs. 1, 3, and 5, and Fig. 5 is a vertical section taken on the line C—D—E, Figs. 2 and 4.

The essential features of my improvements are an elongated fire chamber, extending from front to rear of the furnace; two sets of smoke flues (extending in the same direction as the fire-chamber), each having four or more chambers, through which the smoke &c. successively traverses alternately to the front and rear of the furnace; a central vertical hot air chamber, between these flues connected with two extension diving flues, on the outside of the smoke flues, the cold air being admitted at the top of said diving flues and passing from the same to the aforesaid hot air chamber, being heated in its passage.

The arrangement of the several parts is as follows: *a a a a* (Figs. 4 and 5), is the fire chamber of the shape shown in section in the former figure, the top being pitched each way as represented. The fire box *b b* is near the front of the chamber, and has a proper lining *c*, drop-grate *d*, and ash-pit *e e* below said grate, all as shown in section in the above named figures.

f f f f are the two exterior vertical side plates, each having a rectangular opening *g g g g* for the admission of the cold air; and *h h i i* denote respectively the front and back vertical plates.

At some little distance inward from the plates *f f* &c is fitted on each side of the furnace the trapezoidal inclosure *k k l l*, *k k l l*. Each of these inclosures is subdivided into the hour horizontal and parallel flue chambers *m m n n o o* and *p p*. The bottom plate *k l k l* of each inclosure is placed parallel with the pitch of each side of the top of the fire chamber *a a a a*. The outer plates *h h k k* of said inclosure extend to the top plate *t t* of the furnace, thereby making with the plates *f f f f* the cold air diving flues *q q q q* Fig. 4; while between the inner plates *l l l l* of the two inclosures is the central hot air chamber *r r*, connected with the diving flues *q q q q* before mentioned by the inclined flues *s s*, *s s*, formed between the top of the fire chamber and the bottom of the trapezoidal inclosure as before suggested. The route of cold (at first) (and afterwards, heated), air is indicated by red arrows and said air is distributed from the central chamber *r r*, by conducting pipes *t'*, *t'*, *t'*, leading from the top of said chamber in any desired direction.

The various plates of the trapezoidal inclosures, as well as those subdividing them into flue chambers, are supported on proper ledges, cast on the inside of the front and rear plates *h h* and *i i*, and a communication is established between all the chambers in each inclosure by an opening, alternately at the front and rear of the top plate of each chamber *m m n n*, beginning at the lower chamber *m m*, the openings being denoted at *u u u u* &c. By this arrangement the smoke and other heated products of combustion, after passing from the fire-chamber *a a a a* to the box *x x*, secured to the back of the furnace, are received into each of the lower flue chambers *m m*, *m m* and are then made to travel alternately toward the front plate *h h*, and back plate *i i* of the furnace, until they arrive at the upper chamber *p p*, from which they are discharged through the exit flue *y y* Figs. 1, 3 and 5. The route of the smoke as above described is indicated by black arrows in Fig. 5. By such a provision for the passage of the smoke &c. all the heat that can be derived therefrom is effectually extracted and radiated to the hot air chamber and flues before described in the most advantageous and economical manner.

A box or trough to hold water for evaporation may be inserted at *z* Fig. 4 through the door *h'* Fig. 3, and the several plates composing the furnace after being set up are confined together by the confining rods and nuts shown at *k k*, *k k*, Fig. 5.

The several smoke flues or chambers *m m n n* &c. may be cleared of soot by removing the circular plates or soot valves *a'*, *a'*, *a'*, *a'*, &c. inserted in openings at the front of the stove.

Having thus described my improved portable furnace I shall state my claim as follows:

What I claim as my invention and desire to have secured to me by Letters Patent is—

The combination of four or more horizontal and parallel smoke flues or chambers, each connected with the one next above it, alternately at the front and then at the rear of the furnace, and the top-plate of each chamber having for the purpose an opening to establish the connection as described above, with the two exterior diving cold air flues *q q*, *q q* and the central hot air chamber *r r*, the whole being substantially as herein above set forth.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this fifteenth day of July, A. D. 1848.

JOHN P. HAYES.

Witnesses:

EZRA LINCOLN, Jr.,

BENJ. C. PIPER.