(No Model.)

E. W. WELLS.

HOT AIR FURNACE.

No. 396,905. Patented Jan. 29, 1889.

Fig. 1.

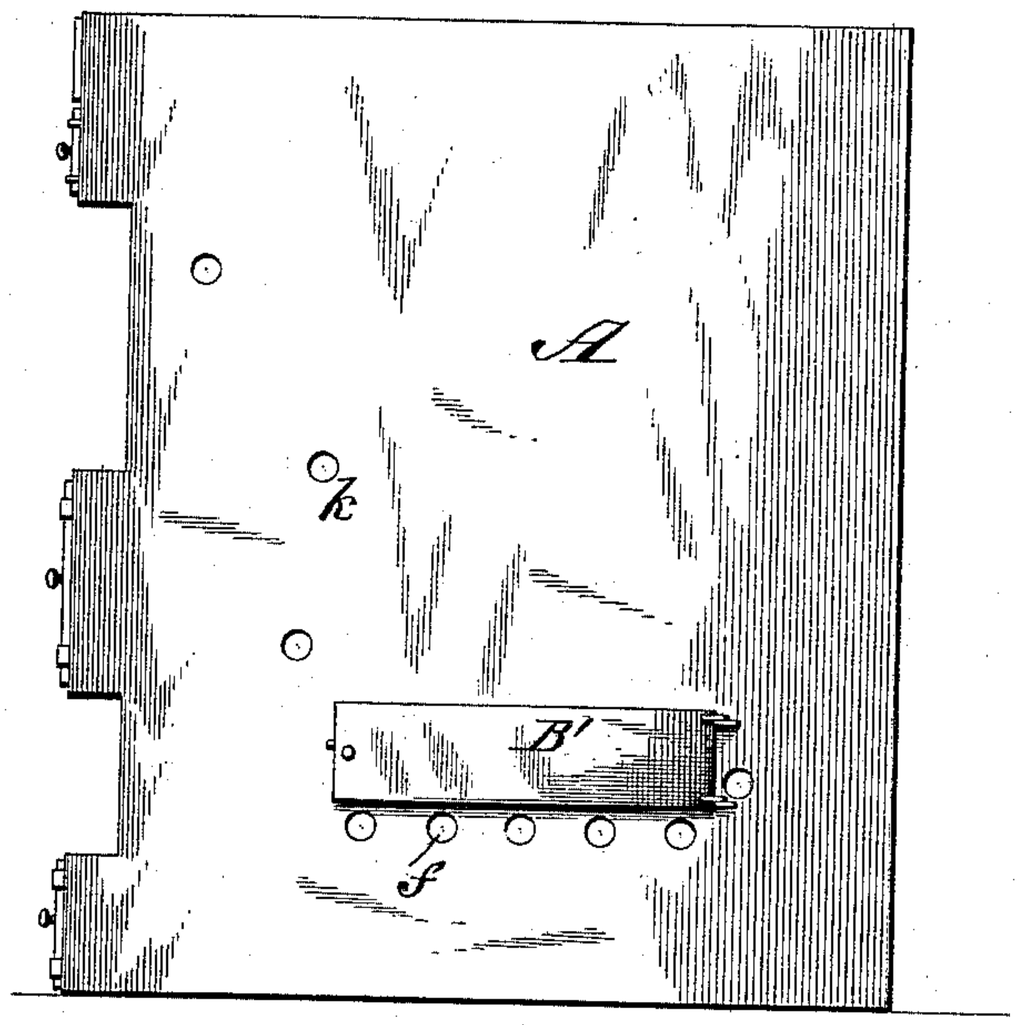
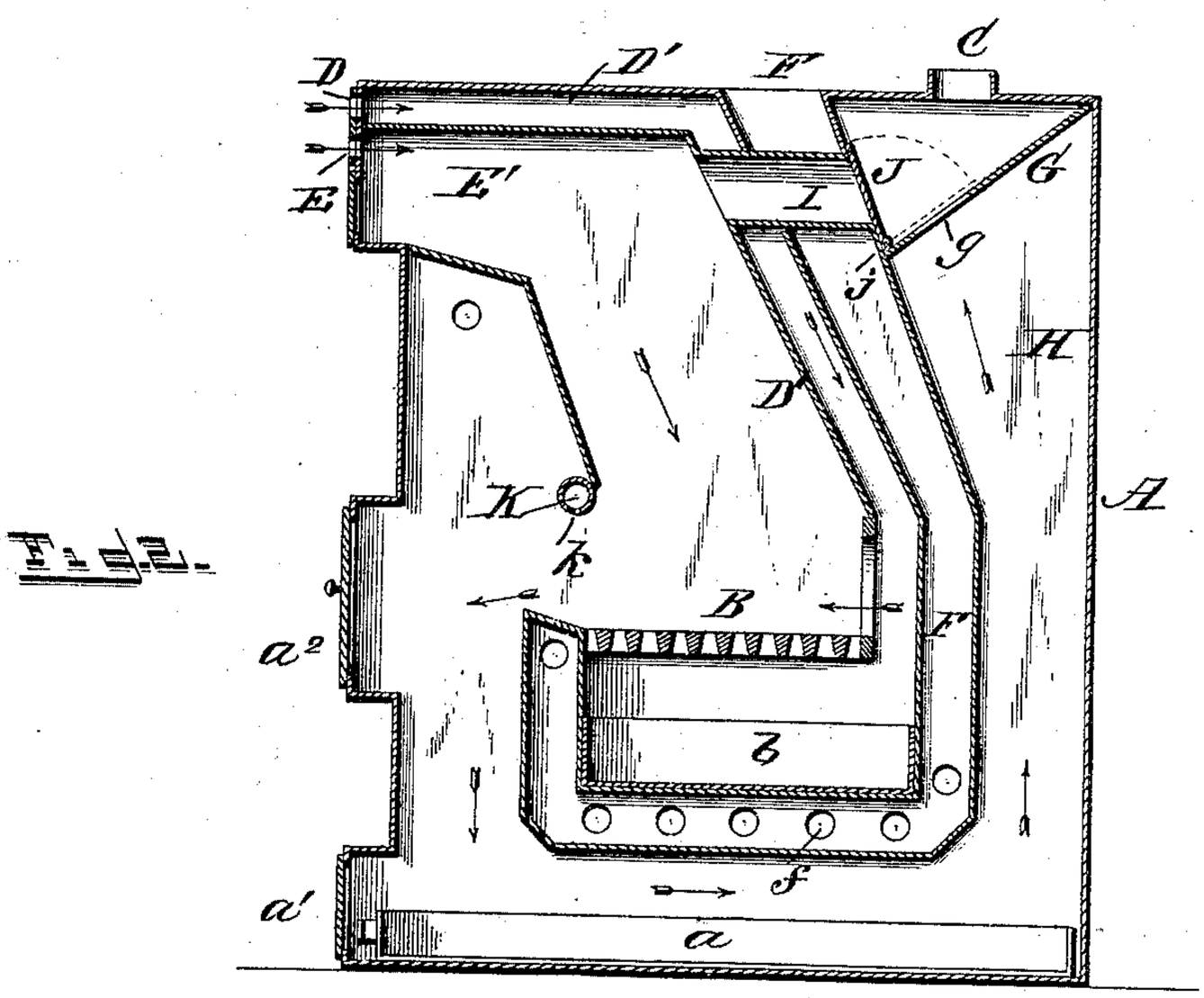


Fig. 2.



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UNITED STATES PATENT OFFICE.

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HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 396,905, dated January 29, 1889.

Application filed May 29, 1888. Serial No. 275,499. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WALTER WELLS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

This invention relates to certain new and useful improvements in hot-air furnaces, and has for its object to simplify and cheapen and to render more efficient in operation this class of devices; also, to provide for the ready conversion of the device into a base-heating, smoke and gas consuming furnace.

To the above ends and to such others as the invention may pertain the same consists in the peculiar combinations and the novel construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a hot-air furnace constructed in accordance with my invention. Fig. 2 is a central vertical longitudinal section through the same.

Referring now to the details of the drawings by letter, A designates the shell of the furnace, provided with suitable removable pan, *a*, door *a'*, and feed-door a^2, all of which may be of any approved or well-known construction.

B designates the grate, supported within the shell in any suitable manner, and having beneath the same an ash-pan, *b*, a door, B', being provided in the side of the furnace to allow access to said ash-pan when desired.

C designates the outlet to the smoke-pipe.

At the upper front side of the furnace are two draft-slides, D E. The slide D controls the admission of cold air into the flue D', which extends about half-way across the top of the furnace, and then inclines downwardly and to the rear, extending back of and beneath the grate, as shown in Fig. 2. The slide E controls the admission of air into the space or chamber E' above the magazine to supply air above the fuel.

F is a flue open at its upper end at the top of the furnace, as shown, and extending down parallel with the flue D' back of, underneath, and in front of the grate, as shown in Fig. 2. The object of this flue F is to increase the heating-surface, and the air admitted thereto through the openings *f* in the sides of the shell of the furnace is heated as it passes up the flue by passing between the two heated plates, and is discharged from the flue at the top of the furnace.

At the upper end of the rear of the furnace I provide the incline plate G, dividing the flue or chamber H into two parts and provided with an opening, *g*, as shown in Fig. 2.

I is the direct-draft flue, affording communication between the upper portion of the chamber E' and the portion of the chamber or flue H above the plate G.

J is a damper, hinged at *j*, and serving to alternately close or disclose the opening *g* in the plate G and the rear end of the direct-draft flue I, as will be readily understood from Fig. 2.

K is a cold-air flue extending transversely of the furnace, and is open at both ends, being supplied with air from the outside of the shell. This flue K has a plurality of perforations, *k*, along its under side for the purpose of letting out fine sprays of cold air that come in contact and mingle with the gases as they pass from the magazine into the flue or chamber H, thereby consuming the same.

In operation the damper J is thrown back on plate G, as shown in dotted lines in Fig. 2, to close the opening therein and to open the direct flue I. In closing up the opening in plate G any draft is prevented from passing from grate B into base-flue H and out at opening in plate G. This is done to make all the draft pass out at direct flue I, that no smoke may come out at the ash-door when removing the ash-pan and at the front door. When removing slate or cinder from grate B, draft-slides D and E are opened, the draft passing in at D, thence into flue D', continues down to back and bottom of the grate, thence up through the magazine to smoke-flue I, then out at C into smoke-pipe. Draft E is also left open to supply air above the fuel to

prevent puffing should there be an accumulation of gases above the fuel.

To make the device base-heating and smoke and gas consuming, the damper J is thrown up to close flue I, that opens the opening *g* in plate G, the draft passing in at draft-slide E, thence down through the fuel in magazine, passing by cold-air flue K forward into base-flue H, and through opening in plate G and out at pipe-collar C into smoke-pipe.

The draft-slide D and flue D′ are for the purpose of supplying more draft at the bottom grate, that the fuel may be consumed faster at that point than any other point in the magazine.

What I claim as new is—

1. In a hot-air furnace, the combination, with the shell, the magazine with draft-slide E, and the grate, of the interior flue, D′, with draft-slide extended beneath the grate and the flue F, around the flue D′, and beneath and up the front side of the grate, and provided with apertures *f*, communicating with the exterior of the shell, substantially as and for the purpose specified.

2. In a hot-air furnace, the combination, with the shell provided with flues D′, F, and H, of the inclined plate G, dividing the flue H into two parts and provided with opening *g*, the direct-draft flue I, and the damper J, pivoted at *j*, arranged to alternately close or disclose the opening *g* or the rear end of the flue I, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

E. WALTER WELLS.

Witnesses:
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