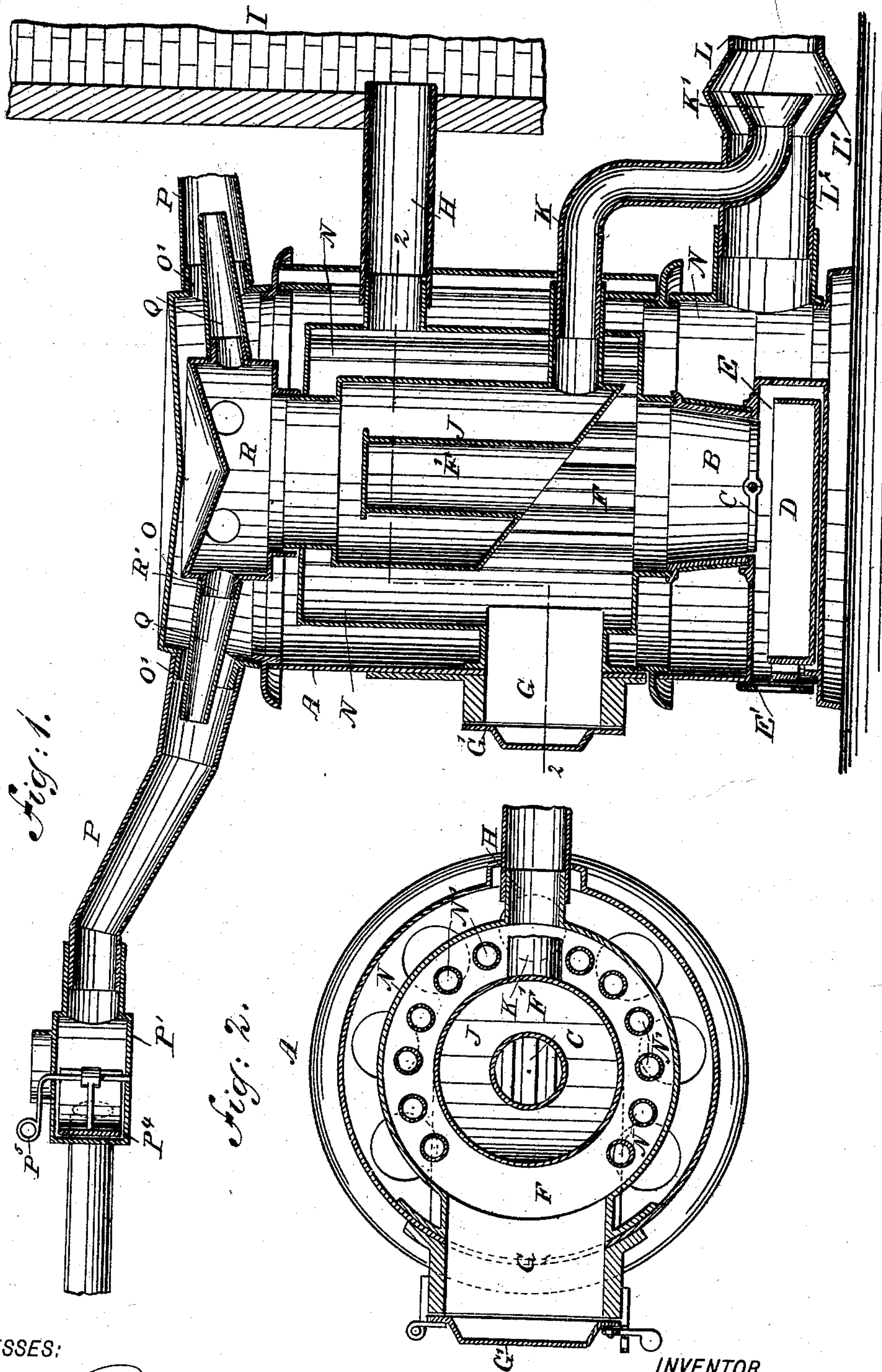


(No Model.)

C. M. BRIDGES.  
HOT AIR FURNACE.

No. 505,697.

Patented Sept. 26, 1893.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

CHRISTOPHER MARTIN BRIDGES, OF SEATTLE, WASHINGTON.

## HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 505,697, dated September 26, 1893.

Application filed March 29, 1892. Serial No. 426,932. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTOPHER MARTIN BRIDGES, of Seattle, in the county of King and State of Washington, have invented a new and Improved Hot-Air Furnace, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved hot air furnace, which is simple and durable in construction, very effective in operation, and arranged to quickly heat the incoming air and keep it pure.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in both figures.

Figure 1 is a vertical section of the improvement; and Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1.

The improved hot air furnace is provided with the usual exterior shell A, made in sections fastened together in any suitable manner.

Within the base or bottom section of the shell A is arranged the fire pot B, provided in its bottom with a suitable grate C, discharging into the ash pit E, also arranged in the lower section of the shell, and provided at the front of the shell with a door E', for conveniently removing the ash pan D, held in the said ash pit E.

The fire pot B is preferably constructed with an interior casing B', made of cast iron, and on the outside of which is shrunk a sleeve B<sup>2</sup>, of cast sheet steel. Thus, in case the cast iron casing B' should break or crack, the pieces are held in position by the steel sleeves B<sup>2</sup>, so that no gas can escape from the fire pot into the interior of the shell A.

On top of the fire pot B is supported the combustion chamber or fire box F, provided at its front with an opening G, through which the fuel is introduced into the fire box and the pot B. The outer end of the opening G is covered by the usual door G'. The fire box or combustion chamber F is provided, near its upper end, with a smoke flue H, leading to the chimney I, for carrying off the smoke and gases.

Within the fire box F is arranged the hot air casing J, having an inclined bottom extending upward from the rear to the front in line with the opening G, so that the said inclined bottom directs the fuel introduced through the opening G to the fire pot B. In the middle of this hot air casing J, and extending from the bottom upward, is arranged a pipe F', in communication with the fire box F, as is plainly illustrated in Fig. 1. The lower rear end of the hot air casing J is connected with a pipe K, formed with a flaring mouth K', opening into the double cone-shaped flange L', arranged on the air duct L, extending to the outside, to permit the outer air to pass through the duct into the pipe K, and from the latter into the hot air casing J. The rear or inner end L<sup>2</sup>, of the duct L extends into the hot air compartment N, formed by the shell A, around the several parts located within the said shell as above described.

Through the fire box F and through the top and bottom extend the air flues N', connecting the lower part of the hot air compartment N with the dome O, so that the cold air entering the said compartment circulates around the fire box F and also through the same by passing through the flues N' which heat the air previous to passing into the dome O. The latter is formed with the usual outlet openings O', connected with the flues P, leading to the several rooms of the building. Each flue P is preferably provided with a valve chamber P' from which lead branch pipes and within which is a valve P<sup>4</sup>, mounted on a vertical shaft P<sup>5</sup>, for alternately opening and closing the branch pipes. The upper end of the hot air casing J discharges into a dome R, located within the shell dome O and provided with outlets R', from which extend nozzles Q, made cone-shaped, and extending a short distance into the flues P. Now, it will be seen, that the hot air passing upward from the hot air casing J into the dome R, passes through the said nozzles Q with considerable force, and as the hot air issues through the contracted ends of the said nozzles it creates considerable draft within the flues P, so that the air is caused to travel rapidly in the said flues and is quickly discharged into the several rooms of the building. It is understood that in the several flues P, the air from the



compartment N and extremely hot air from the hot air casing J mix, but the hot air issuing through the nozzles Q imparts a greater velocity to the air coming from the dome O of the compartment N.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a hot air furnace, the combination with an outer shell provided with outlet flues, and a combustion chamber within the shell and forming with the shell a hot air compartment, of a hot air casing within the combustion chamber, a dome with which the hot air casing communicates and provided with nozzles projecting into the said outlet flues, and cold air pipes for admitting air to the said hot air compartment and casing, substantially as described.

2. In a hot air furnace, the combination with an outer shell provided with outlet flues, a combustion chamber within the shell and forming with the shell a hot air compartment and a cold air duct conducting air into the said compartment, of a hot air casing within the combustion chamber, a dome above the

hot air casing and communicating therewith, cone shaped nozzles leading from the dome and projecting into the said outlet flues, and a cold air pipe leading from the hot air casing into the first named cold air duct, substantially as described.

3. In a hot air furnace the combination with an outer shell provided with outlet flues, a combustion chamber within the shell and forming therewith a hot air compartment, and a cold air duct for conducting air to the said compartment, of a hot air casing within the combustion chamber and having an inclined bottom, a pipe projecting into the casing and having an open lower end, a dome above the hot air casing and communicating therewith, cone shaped nozzles leading from the dome and projecting into the said outlet flues, and a cold air duct leading from the hot air casing into the first named cold air duct, substantially as herein shown and described.

CHRISTOPHER MARTIN BRIDGES.

Witnesses:

H. E. SCOTT,  
I. P. NHELL.