

(Model.)

N. L. NEWCOMB.

FURNACE.

No. 253,939.

Patented Feb. 21, 1882.

Fig. 1.

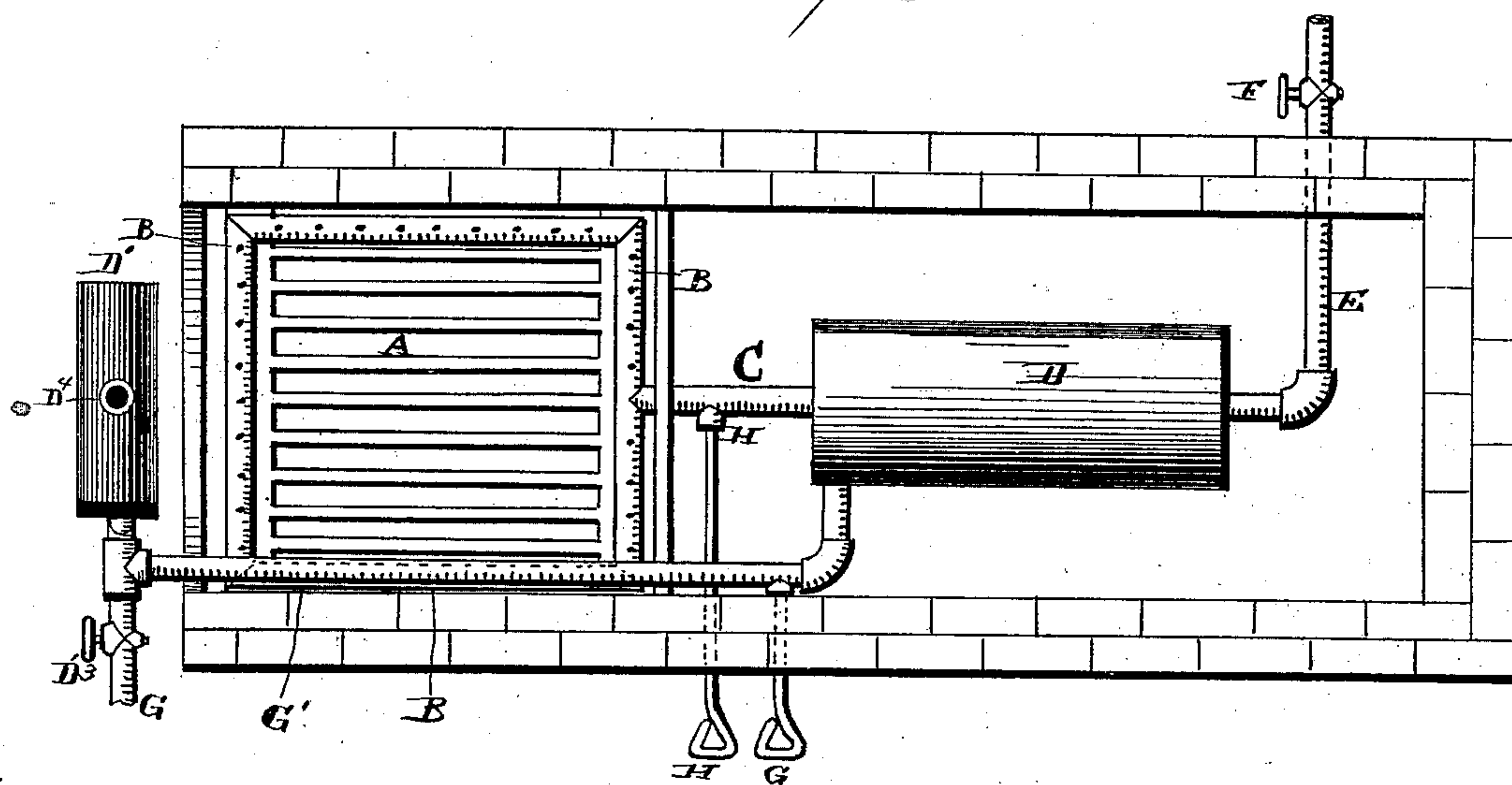
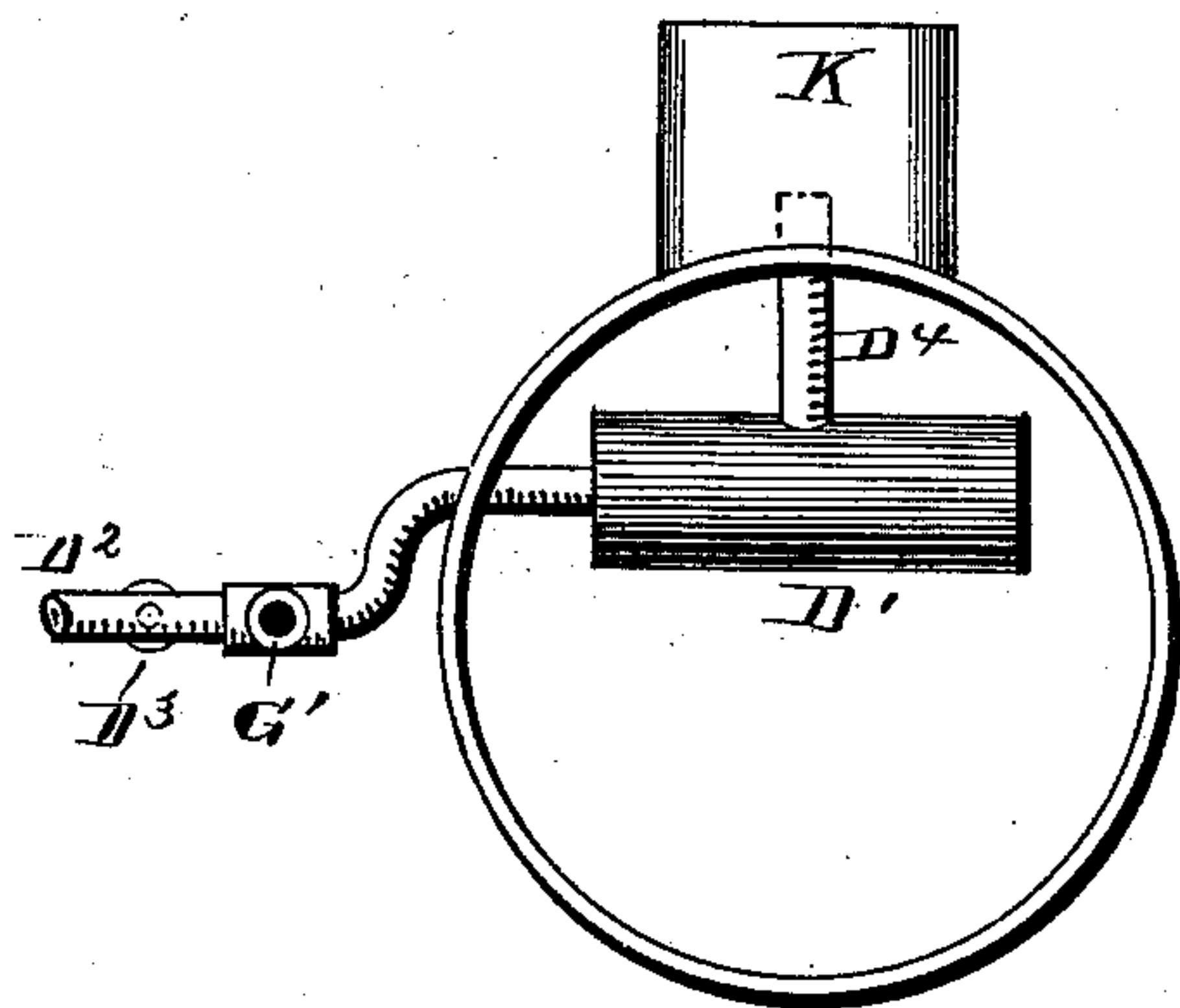


Fig. 2.



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# UNITED STATES PATENT OFFICE.

NATHAN L. NEWCOMB, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF AND JOHN POLLOCK, OF SAME PLACE.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 253,939, dated February 21, 1882.

Application filed August 29, 1879. Renewed August 30, 1881. (Model.)

*To all whom it may concern:*

Be it known that I, NATHAN L. NEWCOMB, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to furnaces; and it consists in the general construction and arrangement of parts, as will be hereinafter specified.

I will describe my invention as applicable to steam-boiler furnaces, although I wish it distinctly understood that I do not limit my invention to its application or adaptation to any specific form of furnace, as it is equally fitted for use in furnaces of almost every description.

In the drawings, Figure 1 is a plan view of a boiler-furnace with the boiler removed so as to show the construction and arrangement of parts constituting my invention. Fig. 2 is an elevation view of the front end of the furnace.

In the said drawings, A is a grate or combustion-chamber.

B is a vented air-chamber laterally surrounding the combustion-chamber, and placed above the grate-bars.

Leading from the vented air-chamber B is a pipe or equivalent connection, C, communicating between the air-chamber B and the rear heating-chamber, D.

Leading from the heating-chamber D is an air-pipe, E, which communicates with an external fan, air-forcing pump, or any blower.

F is a valve for regulating the amount of air passing into the heating-chamber D.

G is a valve regulating the amount of air escaping from the chamber D to the flue K. Excepting at times when a forced draft is required, the valve G is adjusted to prevent the passage of any air through the pipe G'.

H is a valve for regulating the passage of heated air from the heating-chamber D to the vented air-chamber B surrounding the com-

bustion-chamber. The valve H is preferably provided with an extended stem that will project outside of the furnace for apparent convenience of manipulation.

Below, and connecting with the exit-flue K, I place a forward heating-chamber, D', similar to the rear heating-chamber, and communicating with the latter by pipe G'.

The heating-chamber D, instead of being in the form of a cylindrical space, as shown in the drawings, may be constructed in the form of a tortuous pipe or its equivalent, as this would also result in a proper heating of the air forced through it.

The operation of my device is as follows: External air by means of a fan or any suitable blower is forced through pipe E to the rear heating-chamber, D, where it is properly heated. It then passes through the communicating-pipe C to the vented air-chamber B, where it is discharged in its heated condition above the grate-bars within the combustion-chamber, thus furnishing sufficient oxygen for the perfect combustion of the fuel (in the form of smoke) not already consumed upon the grate-bars. When a forced draft is required the valve G is opened, and then hot air is driven through the pipe G', into the exit-flue. Air passed into the chamber D' is heated and then discharged up into the exit-flue through a suitable escape, D<sup>4</sup>. This forward heating-chamber is connected with pipe G', provided with a valve, D<sup>3</sup>, adapted to control its communication directly with the open air, as may be desired.

What I claim is—

1. The combination, with a vented chamber surrounding the fire-space, a rear heater, and a pipe connecting said chamber and heater, of a forward heater communicating with the exit-flue, and a pipe connecting said rear and forward heaters, substantially as set forth.

2. The combination, with a vented chamber surrounding the fire-space, a rear heater, and a pipe provided with a valve which controls communication between said heater and chamber, of a forward heater connecting with the exit-flue, and a pipe provided with a valve which controls communication between said two heaters, substantially as set forth.



3. The combination, with a vented chamber surrounding the fire-space, a rear heater, and a pipe having a valve which controls communication between said heater and chamber, of  
5 a forward heater connecting with the exit-flue, a pipe having a valve which controls communication between the two said heaters, and a pipe provided with a valve which controls communication of said forward heater direct  
10 to with the open air, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NATHAN L. NEWCOMB.

Witnesses:

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WILLARD FRACKER.