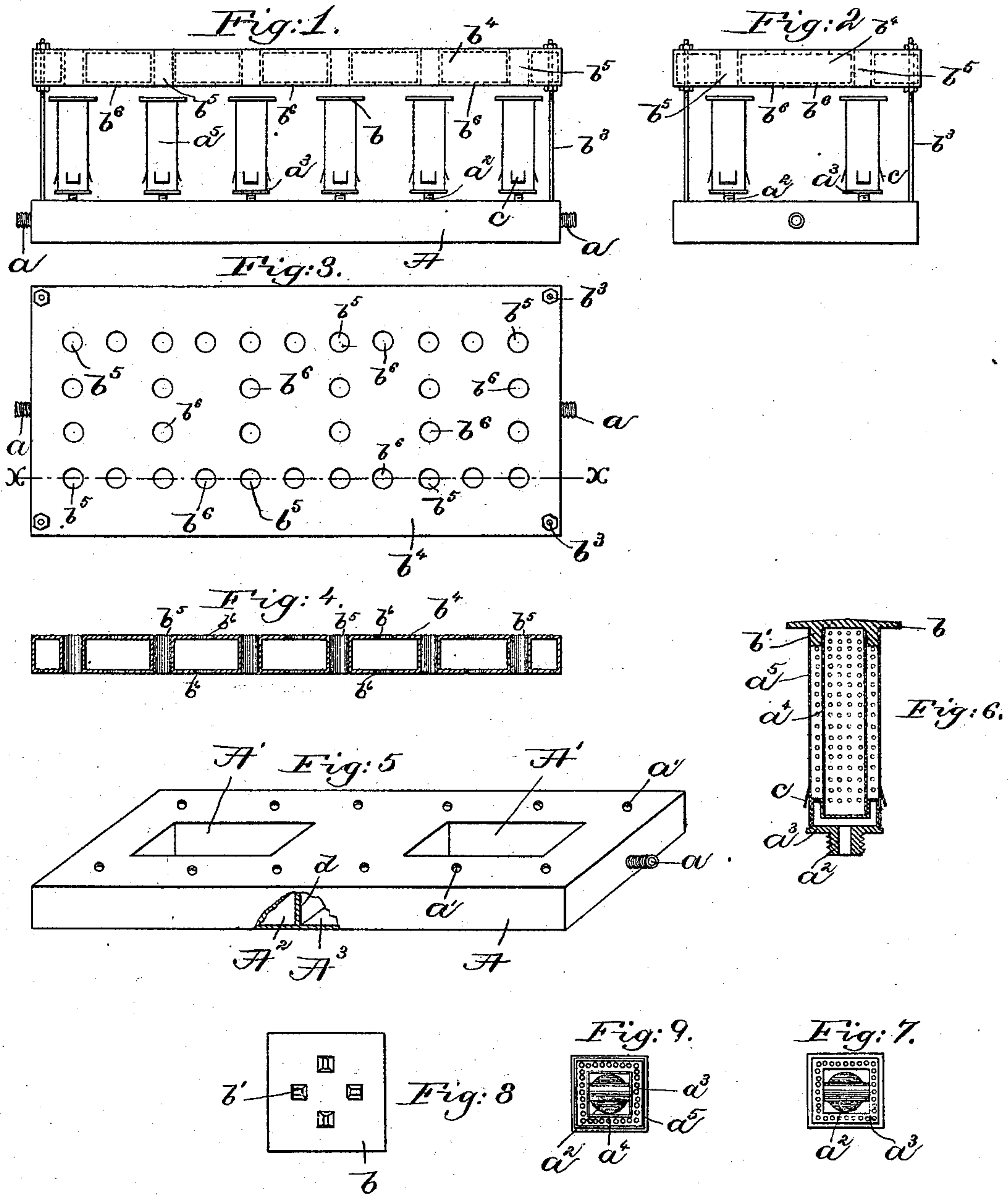


(No Model.)

R. B. CARSLLEY.  
BURNER.

No. 417,541.

Patented Dec. 17, 1889.



Witnesses.

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# UNITED STATES PATENT OFFICE.

ROBERT B. CARSLY, OF NEW BEDFORD, MASSACHUSETTS, ASSIGNOR TO THE TRIUMPH HEAT AND LIGHT COMPANY, OF PORTLAND, MAINE.

## BURNER.

SPECIFICATION forming part of Letters Patent No. 417,541, dated December 17, 1889.

Application filed May 22, 1888. Serial No. 274,659. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT B. CARSLY, of New Bedford, county of Bristol, State of Massachusetts, have invented an Improve-  
5 ment in Burners, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide  
10 a burner or heating apparatus in which gas or vapor fuel may be safely and economically consumed with a maximum yield of heat, my improved heating apparatus or burner, among other things, being especially adapted  
15 to be used in stoves or ranges of ordinary construction as now commonly made.

The particular features of my invention will be pointed out in the claims at the end of this specification.

20 Figure 1 is a side elevation of a heating apparatus embodying my invention; Fig. 2, an end view of the apparatus shown in Fig. 1; Fig. 3, a top or plan view of the apparatus shown in Fig. 1; Fig. 4, a section of the hot-  
25 air chamber on line  $x\ x$ , Fig. 3; Fig. 5, an isometric view of the hollow base or reservoir detached and partially broken out; Fig. 6, a vertical section of one of the independent burners detached; Fig. 7, a top or plan  
30 view of the nipple; Fig. 8, an under side view of a muffle for the independent burners; Fig. 9, a top view of the independent burner with the muffle removed.

The base or reservoir A, cast, as herein  
35 shown, to leave air-spaces  $A'$ , (see Fig. 5,) is hollow to receive gas or vapor fuel admitted therein by inlet-pipes  $a$ , one at each end, only one being shown in Fig. 5, the said hollow base or reservoir being divided transversely,  
40 as herein shown, to form two compartments or chambers  $A^2\ A^3$ . The top or upper face of the hollow base A is tapped to form gas-outlets  $a'$ , into each of which may be screwed the shank  $a^2$  of a hollow nipple  $a^3$ , forming  
45 the base or support of an independent burner, composed, essentially, of an inner tube or pipe  $a^4$  and outer tube or pipe  $a^5$ , of wire-netting or other foraminous metal, fitted upon the said nipple. Each independent burner  
50 is provided with a muffle composed of a preferably metal plate  $b$ , having lugs  $b'$  on its

under side to fit between the outer and inner tubes of the burner to retain the muffle in place. The muffle causes the gas or vapor passing up the burner to pass laterally through  
55 and outside of the tubes, where it is commingled with air, thereby obtaining a more perfect combustion.

The base A supports uprights  $b^3$ , which sustain above the independent burners, preferably, a metal casting  $b^4$ , forming a hot-air-radiating chamber or equalizer, by which the heat generated by the burners is spread out over a substantially large area. The casting  
60  $b^4$  is made hollow, and has its top and bottom provided with holes or openings  $b^5$ , having walls extended through the said casting, the said holes constituting gas-outlets, through which passes the greater portion of  
65 the heat from the independent burners located below the said holes. The casting is also provided with holes  $b^6$ , which communicate with the interior of the casting and form air-holes.

I have herein shown the burners located  
75 near the sides of the base, and consequently the gas-outlets in the casting near the center thereof; but I do not desire to limit myself to any particular arrangement of the burners  
80 on the base or reservoir.

The base or reservoir is divided by the wall  
85  $d$  into two compartments, so that only one-half of the heating apparatus may be used at one time, if desired; but it is evident the said base or reservoir may be divided into any desired number of chambers or compartments,  
90 each having a suitable gas-inlet controlled by a suitable cock. Before any of the burners are lighted the gas admitted to the compartments of the reservoir is under normal pressure; but after lighting one or more of the said  
95 burners the pressure of the gas so stored is increased by its rarefaction due to the heat of the lighted burner, and thereafter the gas passes to the burners under an increased head  
100 or pressure over that in the inlet-pipe, which head, being substantially constant, affords a steadier and better flame. The outer tube is cut, as at  $c$ , and the cut portion bent outwardly to form an air-inlet, by which air is admitted

In operation let it be supposed that gas



has been admitted to the burner and ignited. The gas is prevented from passing directly upward by the muffle, and consequently it must pass through the foraminous tubes; but  
 5 it cannot pass through the inner tube, as a current of cold air is constantly passing up the inner tube; hence it must pass through the sides of the outer tube. The current of cold air meets the muffle and is forced back,  
 10 it being made to seek another outlet, which is through the sides of the foraminous tubes. The air commingles with the gas between the outer and inner tube and combustion takes place; but, owing to the force of the cold air  
 15 in the inner tube and the draft formed by the combustion of the gas, some of the gas which is unconsumed is forced through the outer tube, where it is consumed, the oxygen being supplied by the air on the outside of  
 20 the burner. The flame arising from the combustion of the gas is diffused or spread out laterally by the edge of the muffle overlapping the outer tube, the said flame passing or folding over the muffle and concentrating or  
 25 meeting substantially above the center of the said muffle, thereby obtaining a maximum heat at that point, which point, as herein shown, is substantially in line with the openings  $b^5$ .  
 30 A burner composed, essentially, of an inner and outertube of foraminous metal and a muffle covering the said tubes is not herein claimed, broadly, as it forms the subject-mat-

ter of another application, Serial No. 274,658, filed May 22, 1888.

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I claim—

1. In a heating apparatus or burner, a hollow base or reservoir provided with a gas or vapor inlet, and a plurality of independent burners attached thereto and communicating with  
 40 said hollow base or reservoir, and each composed of an outer and inner foraminous tube, a base or support therefor, and a muffle supported by said tube, combined with a hollow casting or radiator supported above the inde-  
 45 dependent burners and provided with openings for the passage of heat arising from the burners, substantially as described.

2. In a heating apparatus or burner, the combination, with a hollow base or reservoir  
 50 provided with a gas or vapor inlet and with an air-passage  $A'$ , and a wall to separate said reservoir into compartments  $A^2 A^3$ , of a plurality of independent burners attached to the upper side of said reservoir about the air-pas-  
 55 sage  $A'$  and a hollow casting or radiator supported above the independent burners and provided with heat-outlets, substantially as described.

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

R. B. CARSLEY.

Witnesses:

EDMUND RODMAN,  
 J. H. MURKLAND.