No. 817,116. PATENTED APR. 3, 1906.

H. S. HUMPHREY.

WATER HEATER.

APPLICATION FILED FEB. 20, 1905.

2 SHEETS—SHEET 1.

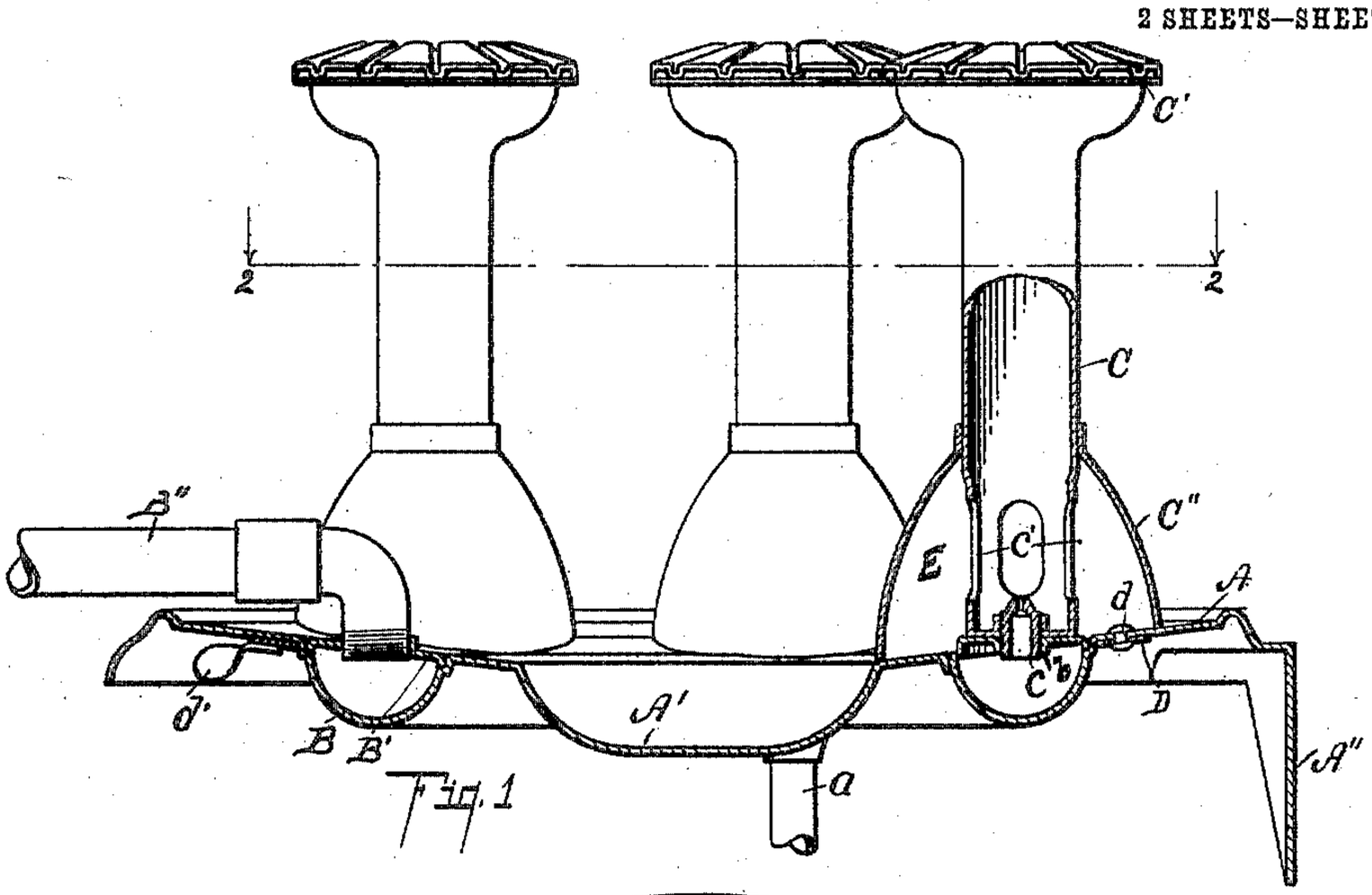

Fig. 1

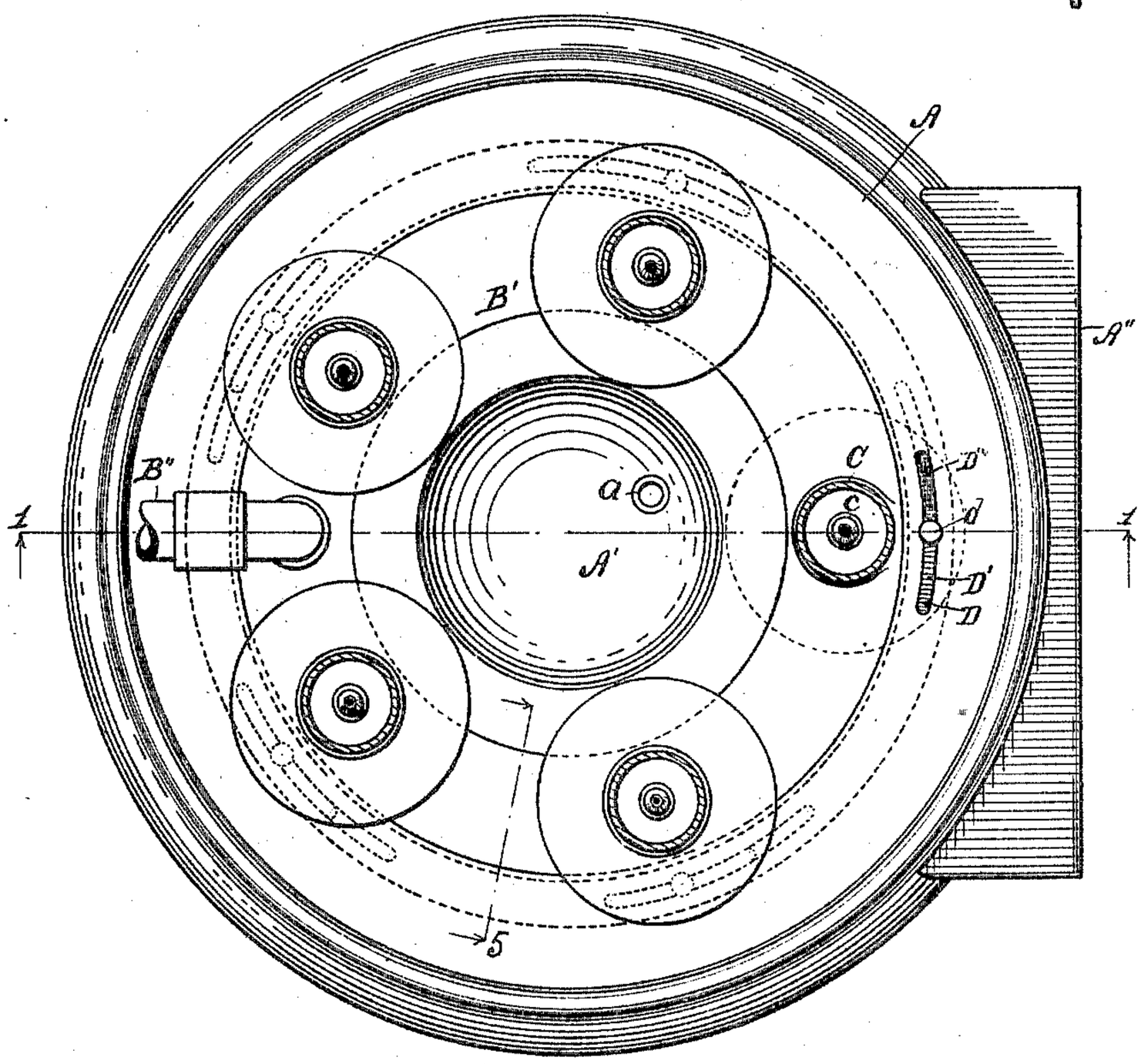

Fig. 2

Witnesses:
W. B. Morgan
Ethel A. Seller

Inventor,
Herbert S. Humphrey
By Chappell & Earl
Att'ys

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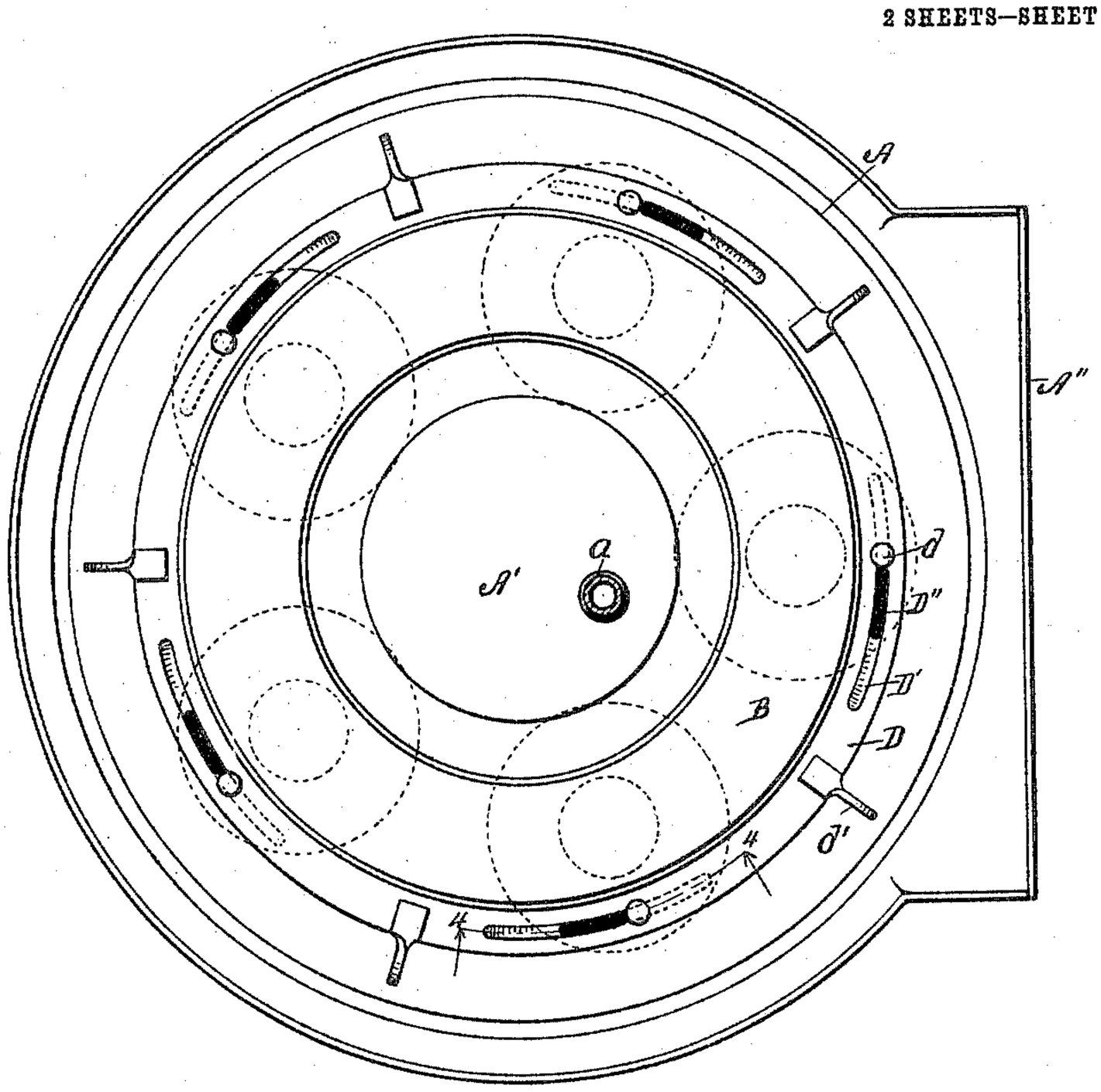

Fig. 3

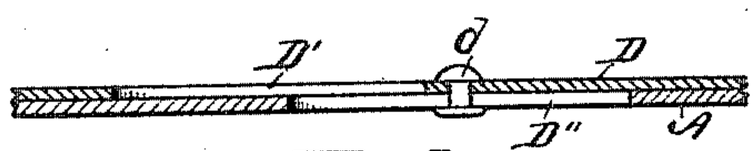

Fig. 4

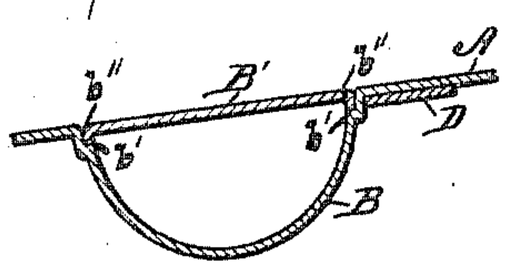

Fig. 5

Witnesses:
W. B. Morgan
Ethel A. Sellers

Inventor,
Herbert S. Humphrey
By Chappell & Earl
Att'ys

UNITED STATES PATENT OFFICE.

HERBERT S. HUMPHREY, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO HUMPHREY COMPANY, OF KALAMAZOO, MICHIGAN.

WATER-HEATER.

No. 817,116. Specification of Letters Patent. Patented April 3, 1906.

Original application filed April 24, 1904, Serial No. 204,775. Divided and this application filed February 20, 1905. Serial No. 246,525.

To all whom it may concern:

Be it known that I, HERBERT S. HUMPHREY, a citizen of the United States, residing at the city of Kalamazoo, county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

This invention relates to improvements in gas-burners for water-heaters.

The objects of this invention are, first, to provide in a water-heater in which a group of gas-burners is used an improved means by which all of the burners may be adjusted at once to regulate the supply of air thereto; second, to provide in a water-heater an improved burner in which the liability of back-lighting or back-firing is reduced to a minimum; third, to provide in a water-heater in which a plurality of burners are used an improved means for supporting the burners; fourth, to provide an improved water-heater in which the parts are so formed and arranged that it may be made of sheet metal.

Further objects and objects relating to structural details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail vertical section of a structure embodying the features of my invention, taken on a line corresponding to line 1 1 of Fig. 2. Fig. 2 is a detail horizontal sectional view taken on a line corresponding to line 2 2 of Fig. 1. Fig. 3 is an inverted plan view of the structure appearing in Figs. 1 and 2. Fig. 4 is an enlarged detail sectional view taken on a line corresponding to line 4 4 of Fig. 3. Fig. 5 is an enlarged detail sectional view taken on a line corresponding to line 5 5 of Fig. 2 through the gas-delivery tube, showing the structural details thereof.

In the drawings the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the base-plate or bottom A is provided with a centrally-located depressed portion or well A′. This well A′ is provided with a drip-pipe, as *a*. A bracket A″ is formed on one side of the base-plate for securing the same to the wall or other support. The base-plate is preferably stamped up from a single piece of sheet metal.

The casing of my improved water-heater rests upon the base-plate or bottom; but as its arrangement thereon is thought to be obvious it is not here illustrated.

A ring-like gas-delivery tube B is provided for the burners. This gas-delivery tube is connected to a suitable gas-supply by the pipe B″. The bottom portion of the gas-delivery tube B is formed integral with the base-plate A by forming an annular trough-like depression therein. This trough is provided with a top plate B′, as clearly appears in Figs. 1 and 5. A shoulder *b*′ is formed at each side of the trough to receive the downwardly-turned flanges *b*″ on the top plate B′. This forms a joint, so that the top plate B′ can be readily soldered in position, giving practically a smooth surface on the upper side of the base. The upper side of the plate B′ is provided with threaded openings or sockets *b* to receive the burner-nozzles *c*. These burner-nozzles *c* are secured to the lower ends of the burner-tubes C. The lower ends of the burner-tubes C are turned inwardly and upwardly to embrace the nozzles, as is illustrated in Fig. 1 of the drawings, so that they are readily secured in position. The burner-tubes are provided with suitable air-ports *c*′ at their lower ends. Arranged on the lower ends of the burner-tubes, so as to embrace the air-ports *c*′ thereof, are hoods or casings C″. These casings or hoods form air-chambers E about the portions of the tubes having air-ports *c*′ therein. Air is supplied to these chambers E through the slot-like ports D″ in the base-plate. (See Figs. 3 and 4.) A ring D, having openings D′ therethrough, which are adapted to be brought into register with the slots D″ in the base-plate, is slidably secured to the under side of the base-plate by the rivets *d*, which engage

the slots D''. The ring D is provided with a thumb-piece *d'*, by which it may be adjusted. With the parts thus arranged the adjustment of the ring controls the size of the inlet-ports D'' of the air-chambers E, thereby controlling the supply of air to the burners.

The burner-tubes C are provided with tips substantially like those illustrated and described in my copending application, filed April 24, 1904, Serial No. 204,775, of which this is a divisional application.

With the parts of my improved water-heater formed and arranged as described I am enabled to form the same entirely of sheet metal, which forms a light and economical structure and one which is very readily assembled or disassembled should occasion require. By forming the base-plate in this manner the water-heater casing, with its contained parts, can be removed and free access had to the burners. The air-ports are protected, so that back-lighting or back-firing, which is liable to occur in structures of this class, where the burners are inclosed in a casing, is effectively prevented. The valves of the burners are easily adjusted to regulate the supply of air. With the base-plate formed with the well A' therein any water such as arises from condensation and the like is collected and delivered from the heater. The valves are so protected that they do not come into contact with the moisture from the heater, and thus are not liable to corrode or become obstructed. By my improved construction and arrangement of the burners the heat is evenly distributed within the casing.

I have illustrated and described my improved water-heater in the form preferred by me on account of its structural simplicity and the economy with which the parts may be produced and assembled. I am aware, however, that it is capable of very great variation in structural details without departing from my invention.

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

1. The combination of a base-plate formed of sheet metal, having a depressed central portion or well, and having an annular trough-like depression therein; a top plate for said annular depression, having threaded openings therein, coacting therewith to form a gas-delivery pipe; threaded delivery-nozzles adapted to be secured in the threaded openings in said top plate; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming air-chambers about said ports; air-ports in said base-plate opening into said chambers; and a ring having openings therethrough adapted to be brought into register with the air-ports in said base-plate, adjustably secured thereto, for the purpose specified.

2. The combination of a base-plate formed of sheet metal, having a depressed central portion or well and having an annular trough-like depression therein; a top plate for said annular depression, having threaded openings therein, coacting therewith to form a gas-delivery pipe; threaded delivery-nozzles adapted to be secured in the threaded openings in said top plate; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming air-chambers about said ports; and air-ports in said base-plate opening into said chambers, for the purpose specified.

3. The combination of a base-plate formed of sheet metal, having a depressed central portion or well, and having an annular depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming chambers about said ports; air-ports in said base-plate opening into said chambers; a ring having openings therethrough adapted to be brought into register with the air-ports in said base-plate, adjustably secured thereto, for the purpose specified.

4. The combination of a base-plate formed of sheet metal, having an annular depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming chambers about said ports; air-ports in said base-plate opening into said chambers; a ring having openings therethrough adapted to be brought into register with the air-ports in said base-plate, adjustably secured thereto, for the purpose specified.

5. The combination of a base-plate formed of sheet metal, having a depressed portion or well at the center, and having an annular depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; suitable burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming chambers about said ports; air-ports in said base-plate opening into said chambers; and a valve common to all of said air-ports in said base-plate, for the purpose specified.

6. The combination of a base-plate formed of sheet metal, having an annular depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming chambers about said ports; air-ports in said base-plate opening into said chambers; and a valve common to all of said

air-ports in said base-plate, for the purpose specified.

7. The combination of a base-plate formed of sheet metal, having a depressed portion or well at the center and having an annular depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes and contacting with said plate, forming inclosed chambers about said ports; and air-ports in said base-plate opening into said inclosed chambers, for the purpose specified.

8. The combination of a base-plate formed of sheet metal, having an annular depression therein; a top plate for said annular depression, coacting therewith to form a gas-delivery pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes and contacting with said plate, forming inclosed chambers about said ports; and air-ports through said base-plate opening into said inclosed chambers, for the purpose specified.

9. The combination of a base-plate; a gas-supply pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming inclosed chambers about said ports; air-ports in said base-plate opening into said inclosed chambers; a ring having openings therethrough adapted to be brought into register with said ports in said base-plate, adjustably secured thereto, for the purpose specified.

10. The combination of a base-plate; a gas-supply pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes forming inclosed chambers about said ports; air-ports through said base-plate, openings into said inclosed chambers; and a valve common to all of the said air-ports in said base-plate, for the purpose specified.

11. The combination of a base-plate; a gas-supply pipe; burner-tubes having air-ports in their lower ends; hoods or casings arranged about the lower ends of said burner-tubes, forming inclosed chambers about said ports; and air-ports in said base-plate opening into said inclosed chambers, for the purpose specified.

12. The combination of a base-plate formed of sheet metal, having a central depressed portion or well, and having an annular trough-like depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe having threaded openings therein; threaded delivery-nozzles adapted to be secured in the threaded openings in said plate; and burner-tubes arranged on said delivery-nozzles, for the purpose specified.

13. The combination of a base-plate formed of sheet metal, having an annular trough-like depression therein; a top plate for said annular depression coacting therewith to form a gas-delivery pipe; and burner-tubes mounted on said top plate, for the purpose specified.

14. In a water-heater, the combination of a base-plate; a gas-supply passage; burner-tubes connected with said gas-supply and extending above the said base-plate, and having air-spaces in their lower ends and above said plate; casings around the lower ends of said gas-burners, extending down to the said plate forming an inclosed space around the air-ports; and air-passages through the said plate into the said inclosed chambers, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in presence of two witnesses.

HERBERT S. HUMPHREY. [L. S.]

Witnesses:

ETHEL A. SELLER,

OTIS A. EARL.