(No Model.) 2 Sheets—Sheet 1.

D. S. RICHARDSON.

HEATER.

No. 521,420. Patented June 12, 1894.

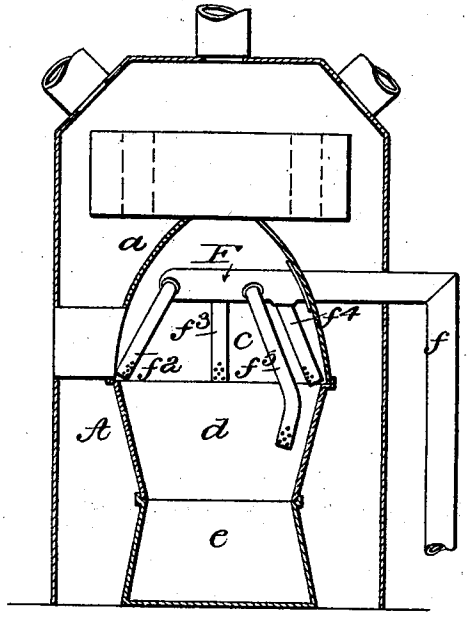

Fig. 1.

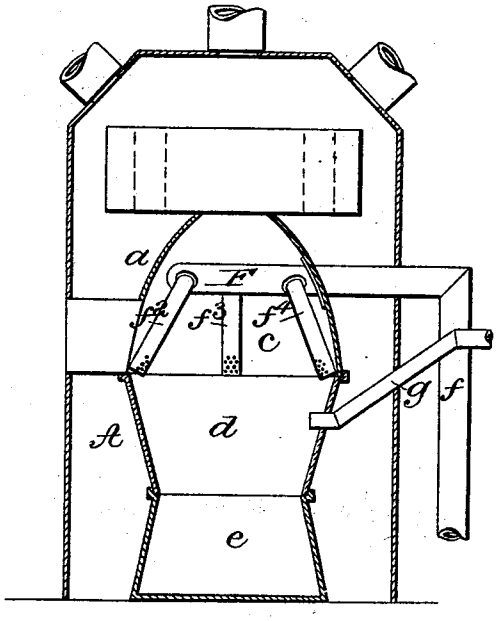

Fig. 2.

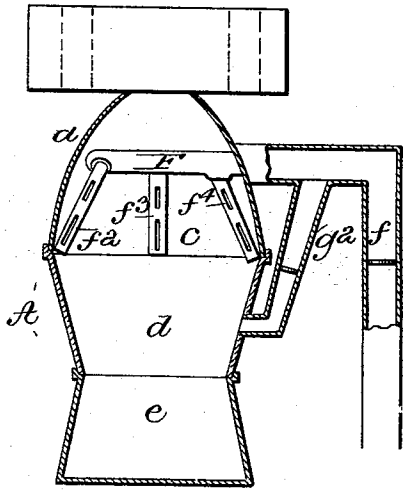

Fig. 3.

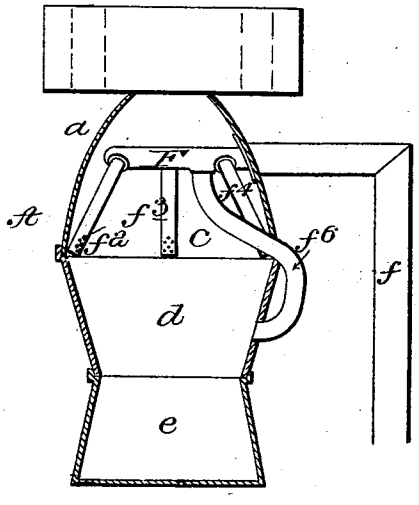

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

D. S. RICHARDSON.

HEATER.

No. 521,420. Patented June 12, 1894.

Fig. 5.

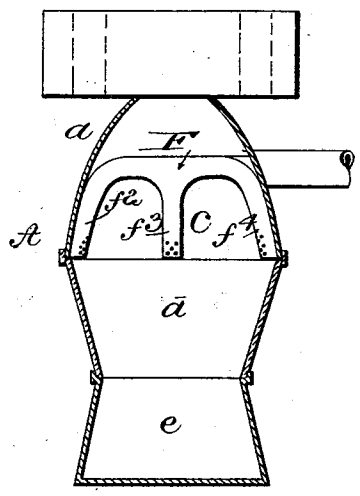


Fig. 6.

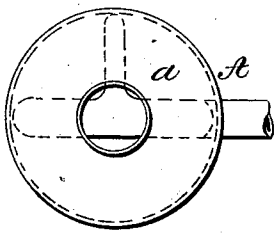


Fig. 7.

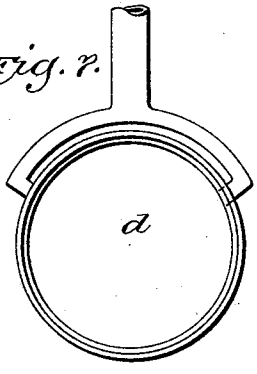


Fig. 8.

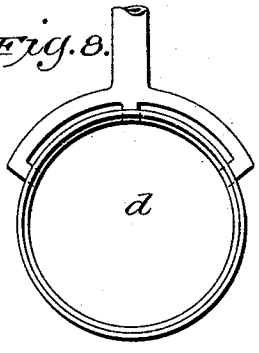
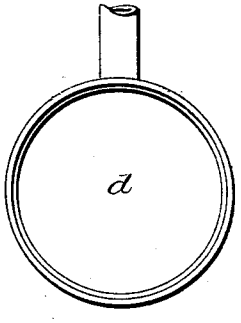


Fig. 9.



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UNITED STATES PATENT OFFICE.

DWIGHT S. RICHARDSON, OF BROOKLYN, NEW YORK.

HEATER.

SPECIFICATION forming part of Letters Patent No. 521,420, dated June 12, 1894.

Application filed March 31, 1894. Serial No. 505,937. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT S. RICHARDSON, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings, in the State of New York, have invented a new and useful Heater, of which the following is a correct description.

The invention relates to means for supplying to the combustion-chamber, and to the fire-pot or fuel-chamber, of a heater, or to either of them, a volume of highly-heated air, for the promotion of combustion;—such means being applicable in the combustion-chamber and in the fuel-chamber of heaters generally,—that is to say, in all heaters in which it may be desired to accelerate and intensify combustion to a very high degree.

In the accompanying drawings, which constitute a part of this specification,—Figure 1 represents a view of a heater which has one form of my air-supplying apparatus applied thereto,—the heater being mainly in vertical section, and the air-chamber and its discharging-conduits, being in elevation. Fig. 2 is a view, in part in vertical section, and in part in elevation, showing a slightly modified form of air-heating and discharging appliances. Fig. 3 is an elevation in which the heater is represented in vertical section,—as in Figs. 1 and 2,—and in which the air-induction and discharging passages are further slightly modified. Fig. 4 is a view in which the heater proper is, in the main, in vertical section, and in which the air-heating chamber and its branches, are in elevation, and are further slightly modified. Fig. 5 represents the heater as in sectional elevation, and the discharging conduits of the air-heating chamber, as further slightly modified in construction and arrangement. Fig. 6 is a plan view, representing a section of Fig. 5. Fig. 7 is a top plan view of a fire-pot, in connection with an air-induction appliance by which air is introduced oppositely, at each side of the fire-pot. Fig. 8 represents a top plan view of a fire-pot in which air is introduced at each side, as in Fig. 7, and, in addition, is supplied at the rear also. Fig. 9 represents a top plan view of a fire-pot, and air-appliance, in which air is supplied through the rear wall of the fire-pot.

In Figs. 1, 2, 3, 4, and 5, A designates the heater as a whole,—*a* being the cone, *c* the combustion-chamber, *d* the fire-pot or fuel-chamber, *e* the ash-pit, *f* the fresh-air supply passage to the air-heating chamber, and F the air-heating chamber, of which f^2, f^3, and f^4 are the shorter, and f^5 and f^6 are the longer air-discharging conduits. In Fig. 2 an independent, downwardly-inclined air-induction passage *g*, discharges air directly into the fire-pot, through an opening in its wall, at about the mid-height thereof;—and in Fig. 3 a similar conduit *g*, extends from the horizontal portion of the air-supply passage *f*, to a similar point in the fire-pot. It will be observed that in Figs. 1, 2, 3, and 4, the downwardly-extending conduits diverge from the central air-chamber, in right lines, and stand out in the midst of the combustion-chamber, in such manner as to receive the full benefit of its high temperature; while in Fig. 5, such conduits are curved, to conform to the interior curvature of the coincident portion of the combustion-chamber, and are exposed to the impact of its great heat, on their inner surface only. In this latter construction however, somewhat greater facility is afforded in supplying fuel to the fire-pot. It will be further noted that under the construction represented in Fig. 1, the longer conduits, f^5, at their lower extremity extend and discharge directly into the body of fuel within the fire-chamber. It will be observed also that under the construction represented in Fig. 4, the longer conduit, f^6, is extended, preferably in two sections, first, through the body of the cone, into the air-chamber of the heater, and then, by its incurved lower section, to an opening in the body of the fire-pot,—thereby accomplishing essentially the same result as under the construction represented in Fig. 1, although not actually extending into the fire-pot at all.

Persons skilled in the art, will understand without further description, that the air-heating chamber receives its supply from any convenient suitable source; and that the conduits may be provided with either end-outlets, or lateral outlets, or with both, as may be found necessary, or expedient.

The invention having been thus described, what is claimed is—

1. An air-heating chamber in the combustion-chamber of a heater, having conduits extending downward toward the sides of the

combustion-chamber, said conduits having openings in them to deliver heated air into the combustion-chamber.

2. An air-heating chamber in the combustion-chamber of a heater, having conduits extending downward toward the sides of the combustion-chamber, said conduits having openings at or near their lower ends.

3. An air-heating chamber in the combustion-chamber of a heater, having one or more arms extending downward toward the sides of the combustion-chamber, and having also a conduit, extending down from said air-heating chamber, into the fire-pot below the normal level of the fire.

4. In combination with an air-heating chamber, in the combustion-chamber of a heater, and having air-feeding conduits, terminating near the top of the fire-pot, a conduit, leading from said air-heating chamber, and extending partially through the combustion chamber to the outside of the same;—the air from the air-heating chamber being carried by said conduit to the fire-pot, below the level of the fire.

5. In combination with an air-heating chamber, in the combustion-chamber of a heater; an air-pipe, having one or more openings, entering the fire-pot below the normal level of the fuel.

6. An air-heating crab or chamber for heaters, having an opening for the admission of air, and having discharge pipes leading therefrom and terminating in substantially the same plane.

7. In combination with an air-heating chamber in the combustion-chamber of a heater, and having air-feeding conduits terminating near the top of the fire-pot, a conduit leading from said air-heating chamber, and entering the fire-pot from the outside thereof, below the normal level of the fuel.

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Witnesses:
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I. H. WARBURTON.