

(No Model.)

D. S. RICHARDSON.
RADIATOR FOR FURNACES.

No. 272,326.

Patented Feb. 13, 1883.

Fig1.

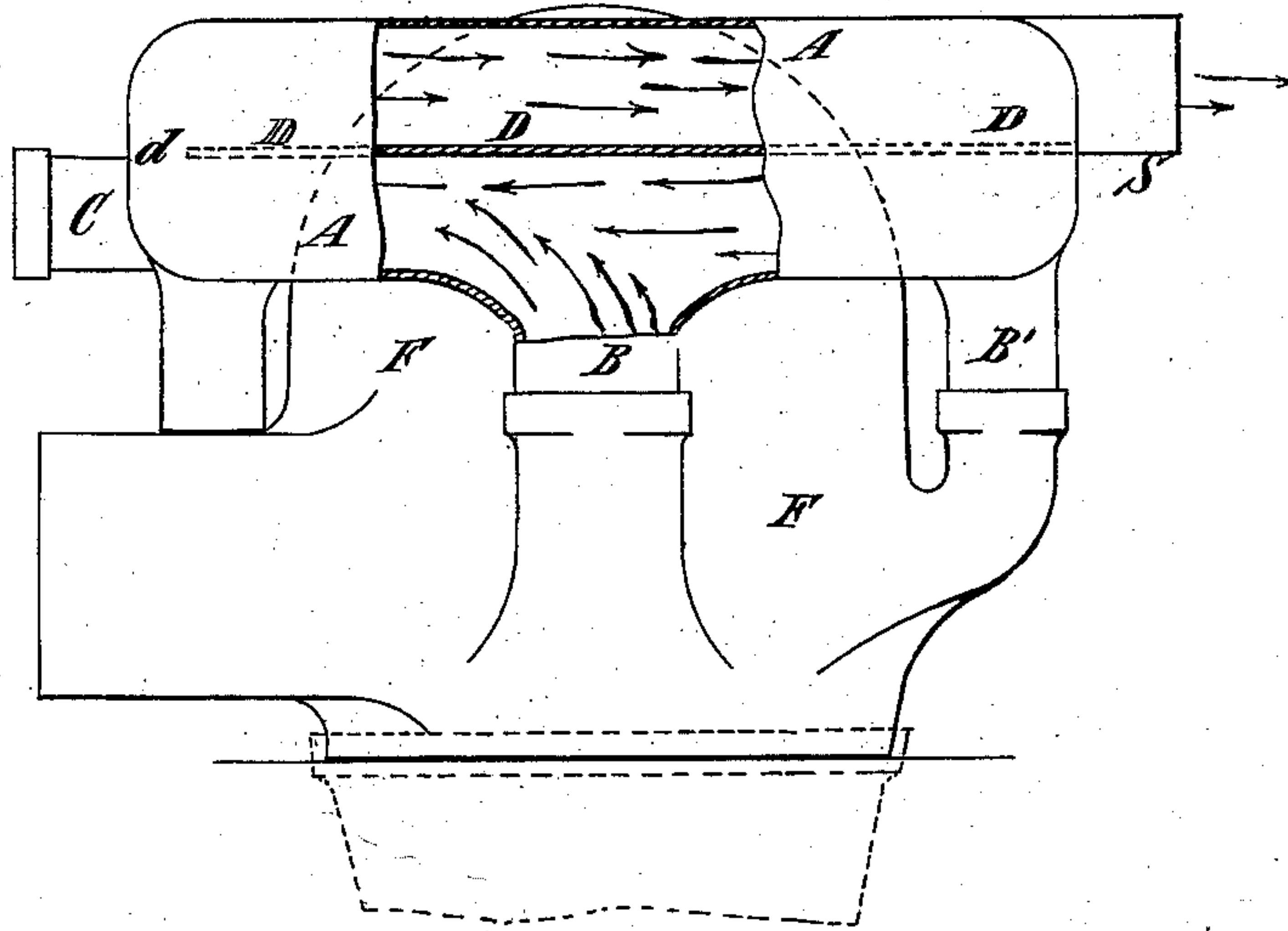


Fig2.

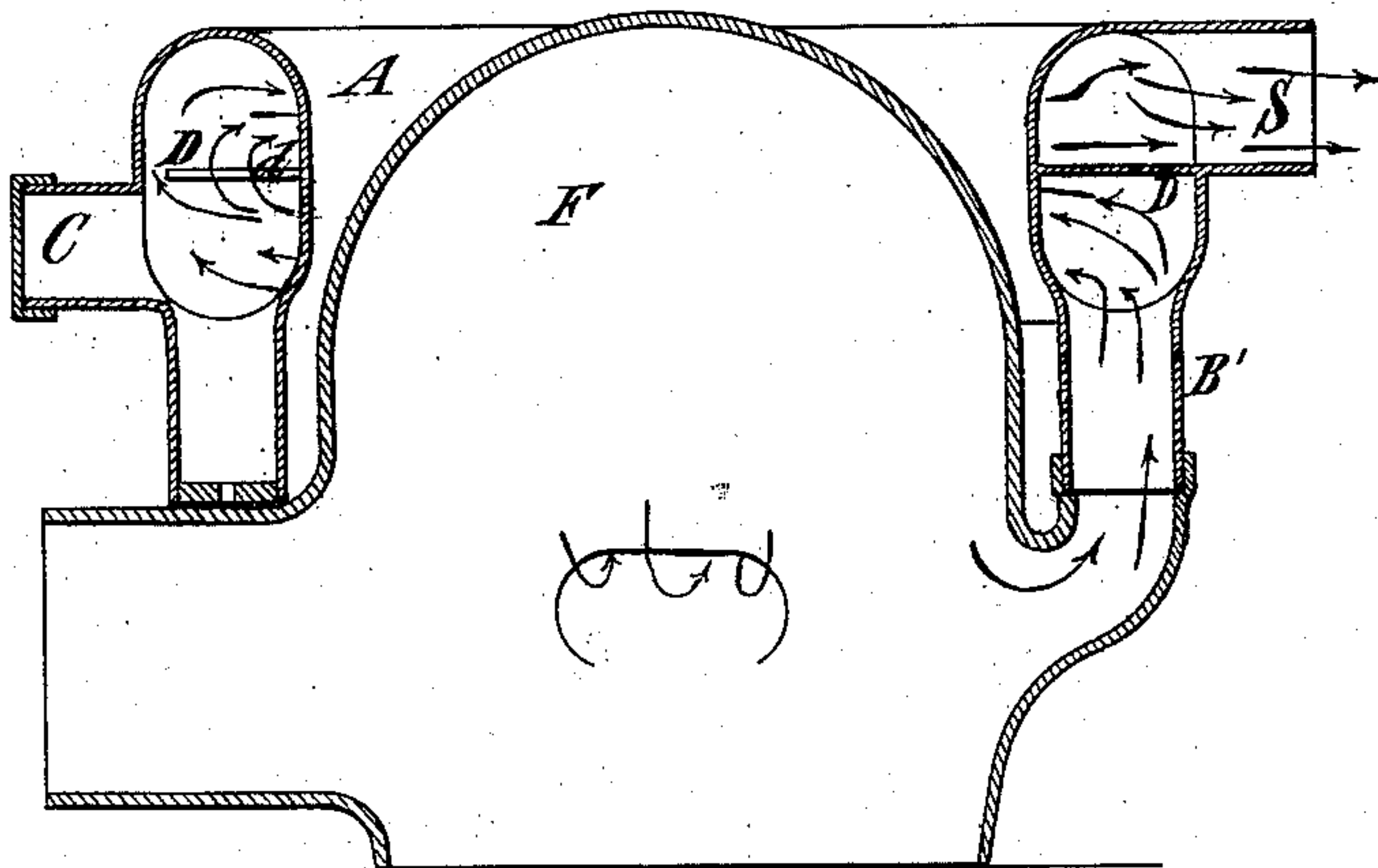
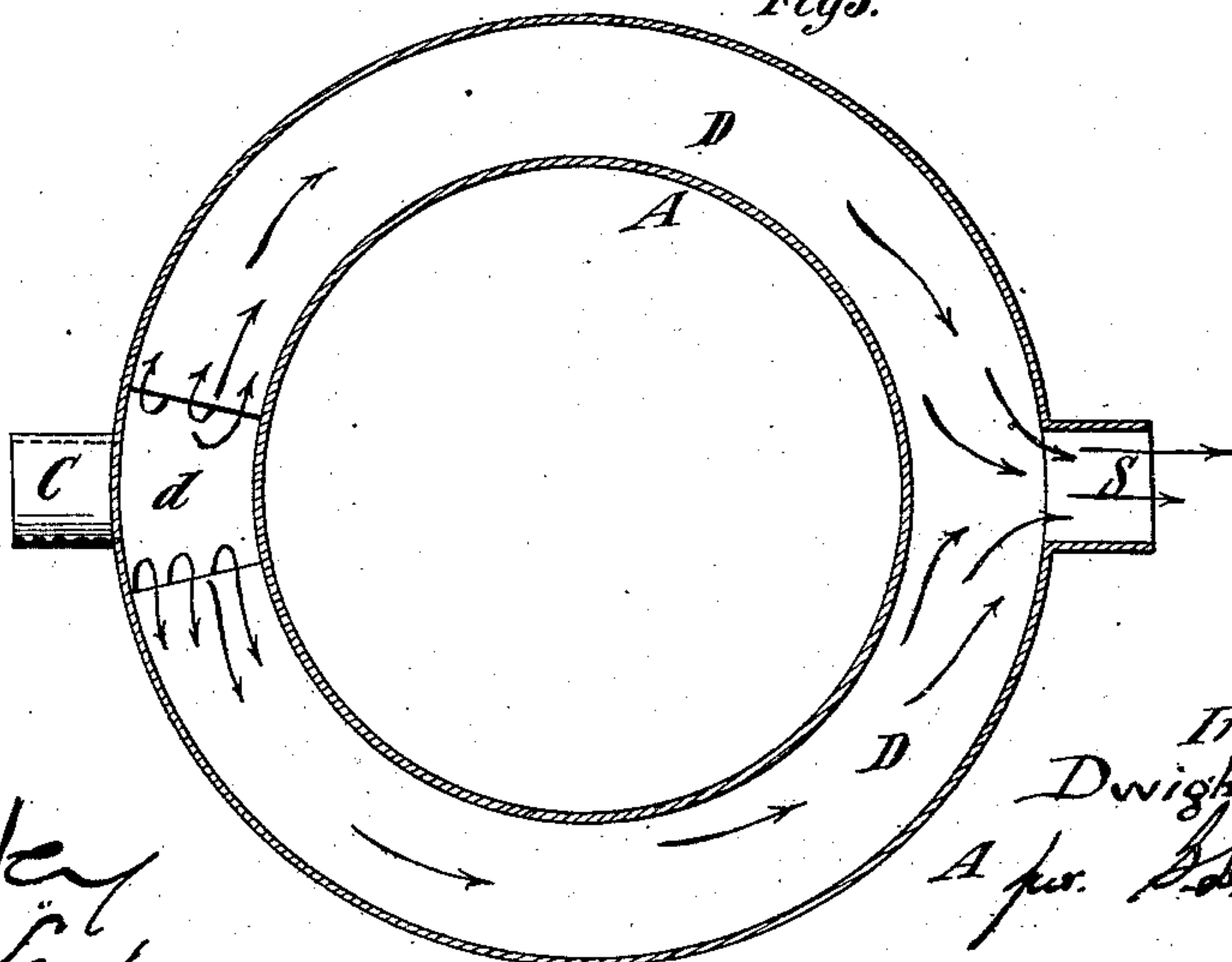


Fig3.



Witnesses:
William White
Samuel Lea

Inventor:
Dwight S. Richardson
A per. *Edw. J. Law*
Attorneys.

UNITED STATES PATENT OFFICE.

DWIGHT S. RICHARDSON, OF BROOKLYN, NEW YORK.

RADIATOR FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 272,326, dated February 13, 1883.

Application filed November 27, 1882. (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, State of New York, have invented a certain new and useful Improvement in Radiators for Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

My invention relates to that part of the furnace termed the "radiator," through which the gases and products of combustion received from the body of the furnace pass before escaping into the chimney; and it has for its object the more complete and effective heating of the radiator by the gases as they pass through it.

In the drawings like letters indicate like parts.

Figure 1 is a view of the radiator in connection with the body of the furnace, a portion of the radiator being broken away to show my improvement. Fig. 2 is a sectional view vertically of the radiator and body of the furnace. Fig. 3 is a horizontal sectional view of the radiator alone above the diaphragm.

The radiator as improved by me is made wholly of cast-iron, cast in one piece, and has a diaphragm or partition extending horizontally through the same, but having an opening at one end, thus dividing the radiator into an upper and lower chamber connecting with each other.

The radiator as constructed by me usually surrounds the dome of the furnace, and is connected with the same by flues, through which the gases and products of combustion pass into it from the body. While this position of the radiator is the most desirable, as decreasing the height of the furnace, it may be placed entirely above the dome, or in any position found desirable.

The nature of my invention is best understood by reference to the drawings, Figure 1 of which shows the radiator A as surrounding the body or dome F of the furnace, and as connected therewith by the flues B B', which open into the interior of the body.

D is the partition, extending horizontally through the radiator, and having in it the opening d, which may be of any size or shape

found desirable, (shown in Fig. 3,) by which the gases and products of combustion pass from the lower to the upper chamber of the radiator.

As will be seen from Fig. 2, the products of combustion pass at once from the combustion-chamber to the top of the dome, and are there deflected by the sides of the dome until they escape, by means of the flues B B', into the lower chamber of the radiator, through which they circulate in the direction indicated by the arrows, and then pass, through the opening d of the diaphragm, into the upper chamber of the radiator, through which they pass in an opposite direction into the smoke-pipe S. The heated smoke and gases thus circulate through the radiator twice, thus securing a much greater and more effective heating-surface than is obtained with the radiators now used, consisting of a single chamber. The radiator has one or more flues, which receive the gases, &c., from the body of the furnace, and these flues are preferably situated toward or near the part or end of the radiator farthest from the opening d in the partition, so that the gases and products of combustion will circulate through the whole extent of the lower chamber before they pass into the upper chamber of the radiator, and for the same reason the hole S, by which the gases, &c., escape into the chimney, is situated on the opposite side of the radiator from the opening d. At C is an opening, closed by means of a plate, for removing the ashes, &c., which collect in the radiator.

By my improved radiator I thus obtain a greater quantity of effective heat from the same amount of gaseous products or from the combustion of the same amount of coal. The radiator A is preferably cast solid or in a single piece, as thereby all joints, except where the flues B B' connect with the body of the furnace, are avoided, and the gaseous products of combustion cannot escape into the air-chamber and vitiate the air therein.

I prefer to cast the partition or diaphragm solid with the radiator, so that the radiator and the partition will constitute but one piece of casting; but the diaphragm may be cast separate from the radiator, and, if desired, of two or more pieces or sections, and tightly secured therein by flanges or their equivalent. The diaphragm D may be flat, as shown in the

drawings, or may be curved or angular, or with a corrugated or waved surface.

I am aware that in magazine-stoves a heating-drum encircling a magazine and having a
5 diaphragm dividing the drum into lower and upper flues has been made. I am also aware that in hot-air furnaces a drum in which the products are made to pass first to the top and then to the bottom of the same has been con-
10 structed. I do not claim either of these; but

What I claim is—

1. The combination, with the body of an air-heating furnace, and encircling the dome of the combustion-chamber of the same, of a solid
15 cast-iron radiator having a diaphragm or partition extending through the same, with an

opening therein connecting the two chambers of the radiator, substantially as and for the purposes set forth.

2. The combination, with the body of an air- 20 heating furnace, and encircling the dome of the combustion-chamber of the same, of a cast-iron radiator the body of which is cast in one piece, and having a diaphragm or partition provided with an opening, as set forth, ex- 25 tending horizontally through the same, all substantially as set forth.

DWIGHT S. RICHARDSON.

Witnesses:

S. NELSON WHITE,
SAMUEL LEA.