

(No Model.)

H. THOMPSON.
FURNACE FOR STEAM BOILERS.

3 Sheets—Sheet 1.

No. 353,610.

Patented Nov. 30, 1886.

Fig. 3.

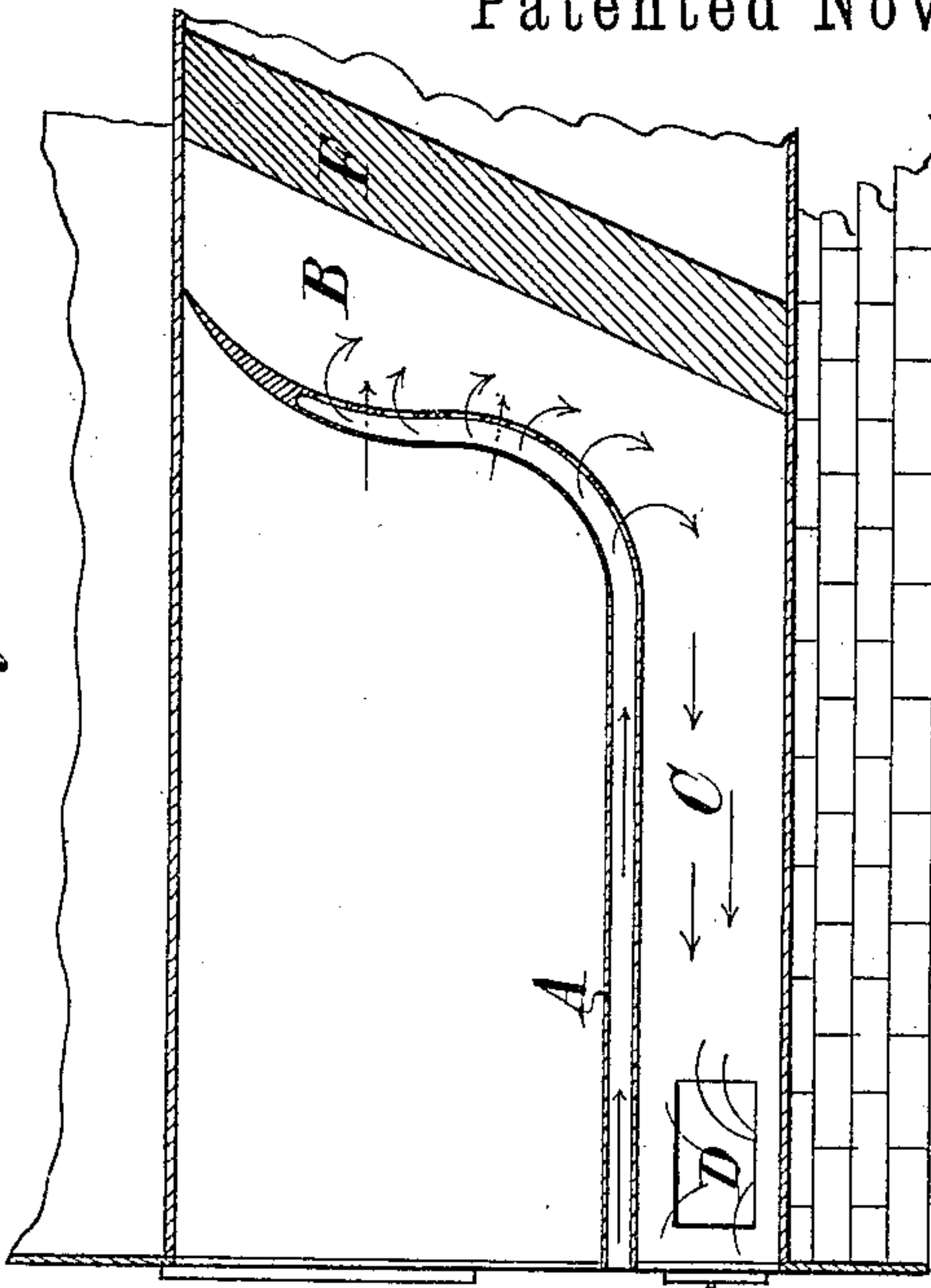


Fig. 2.

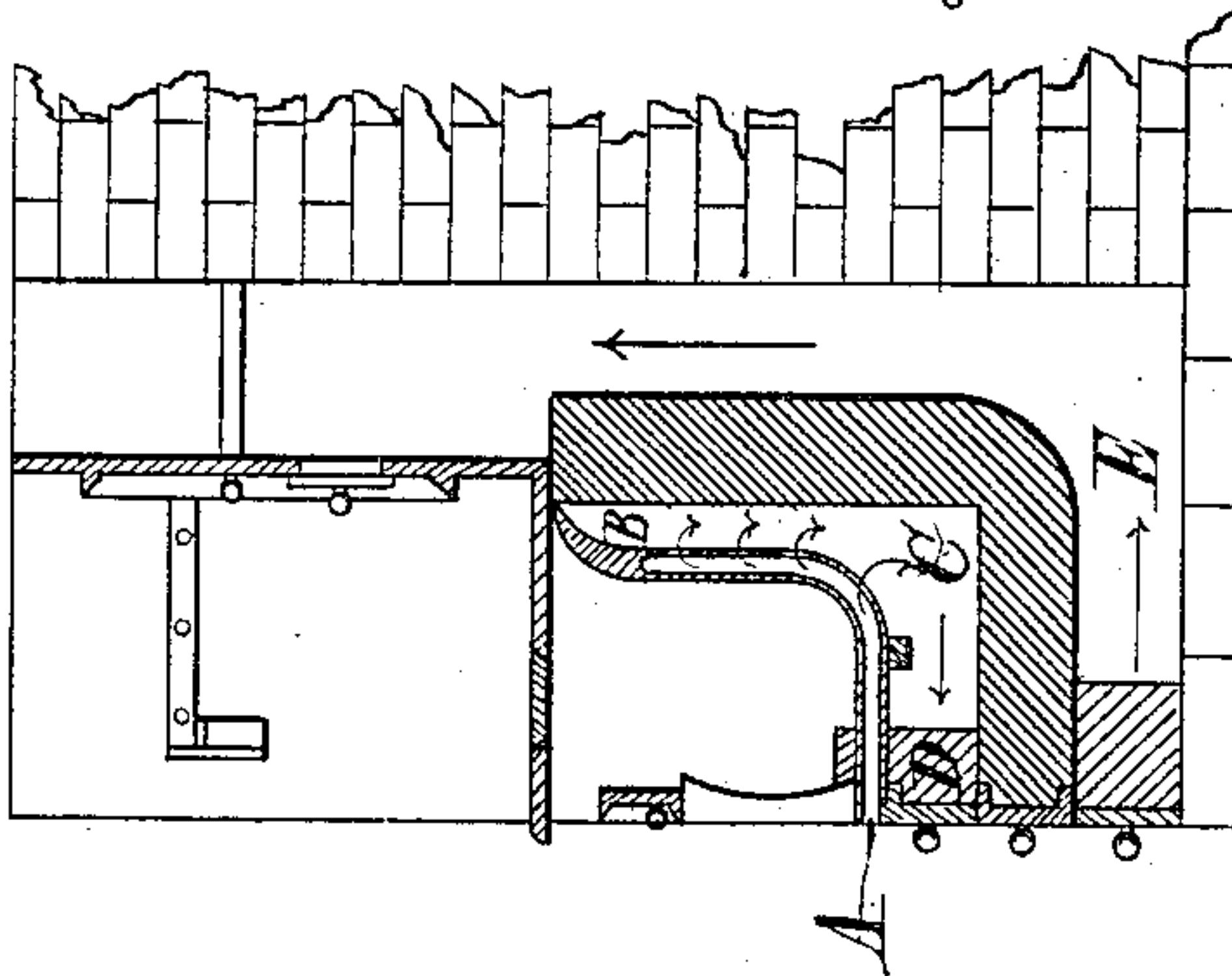
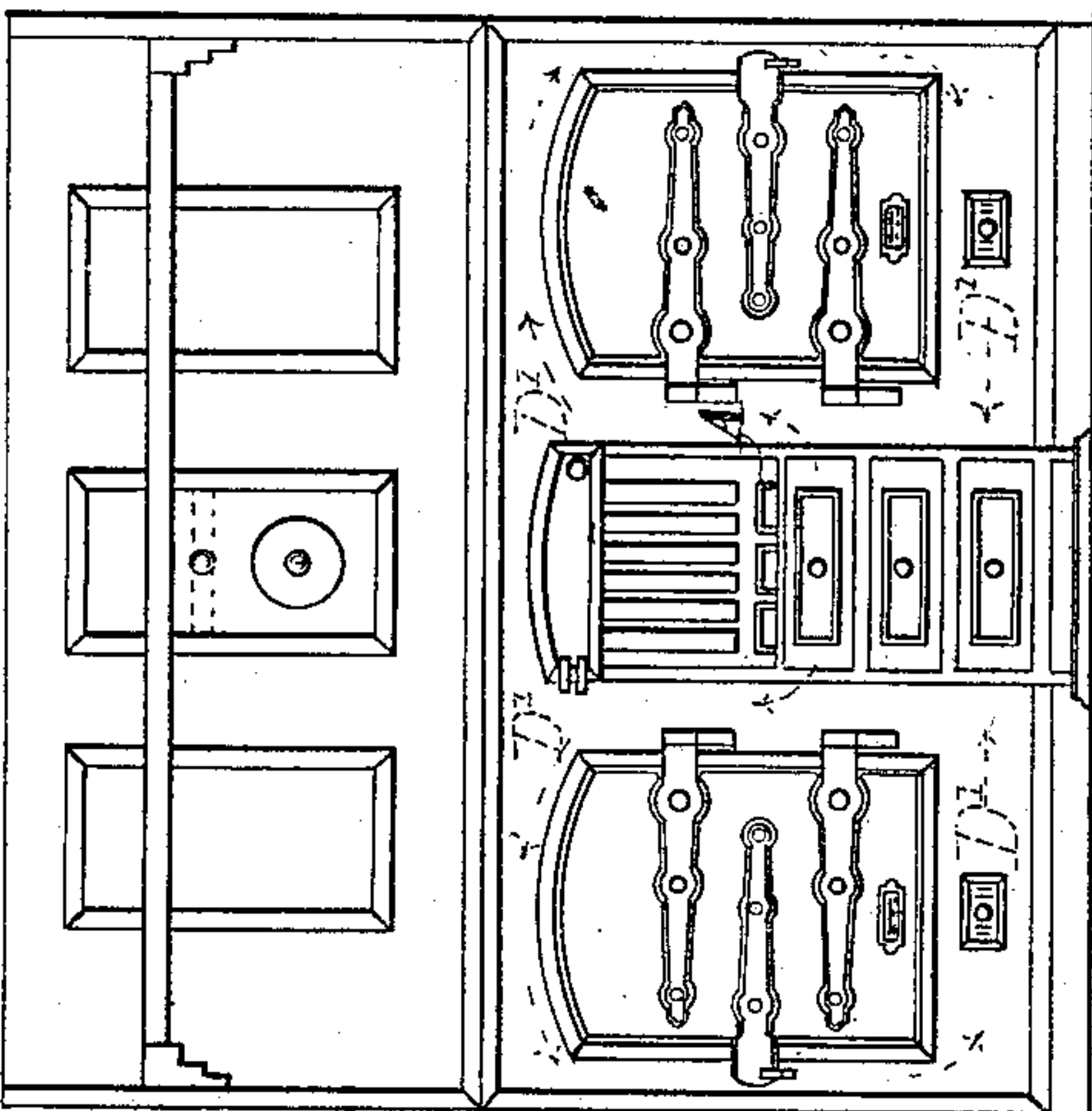


Fig. 1.



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Fig. 5.

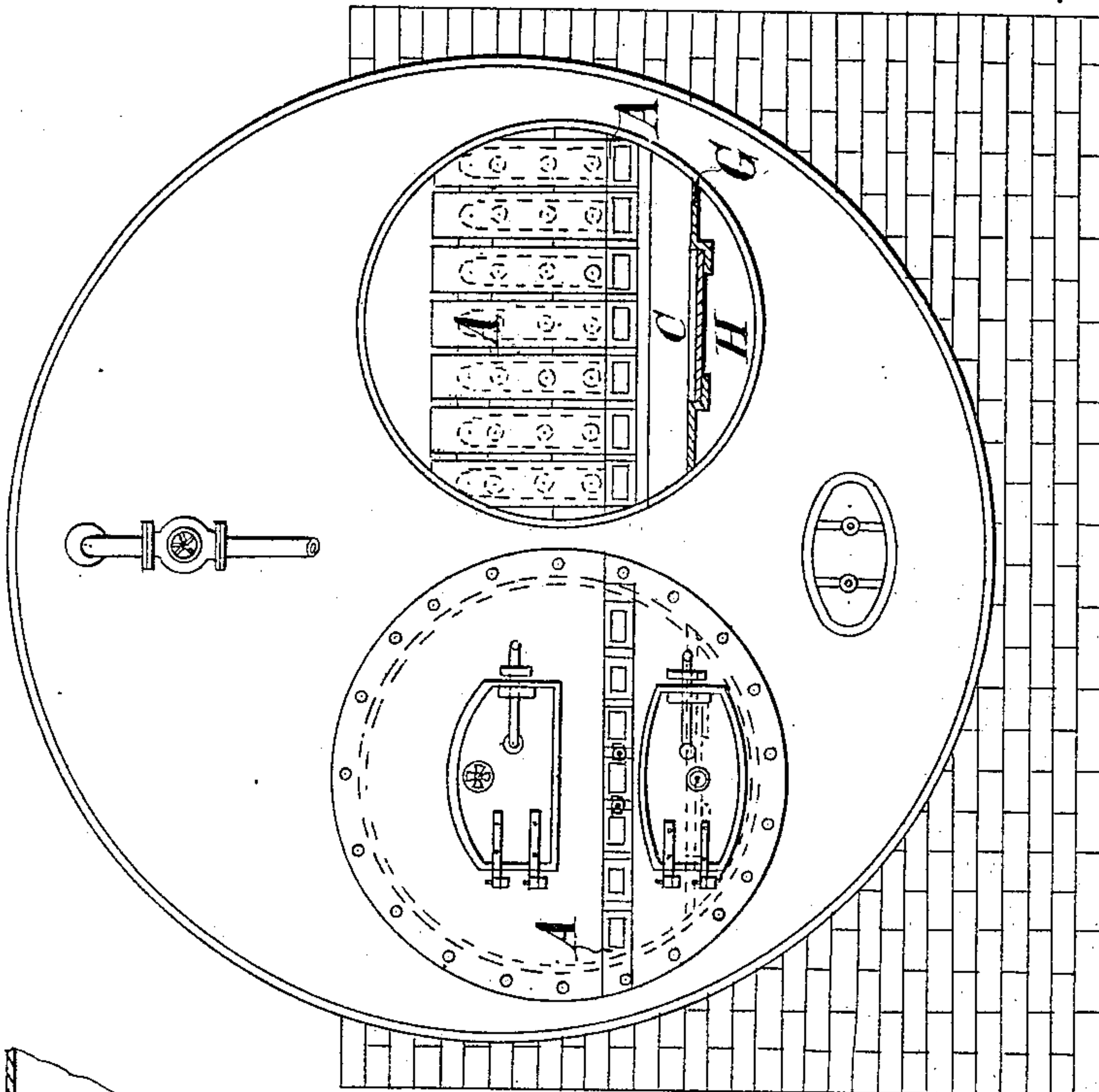
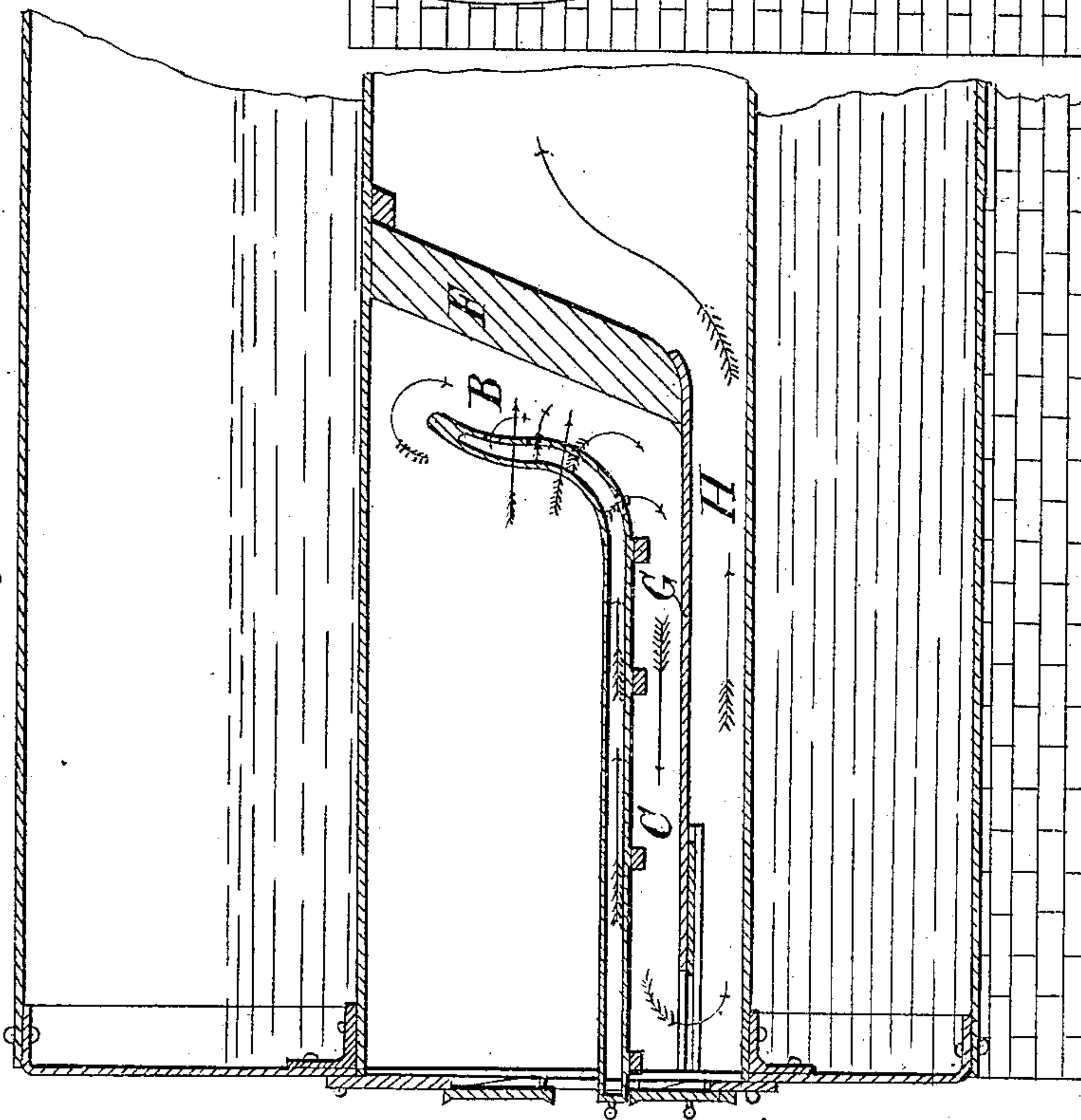


Fig. 4.



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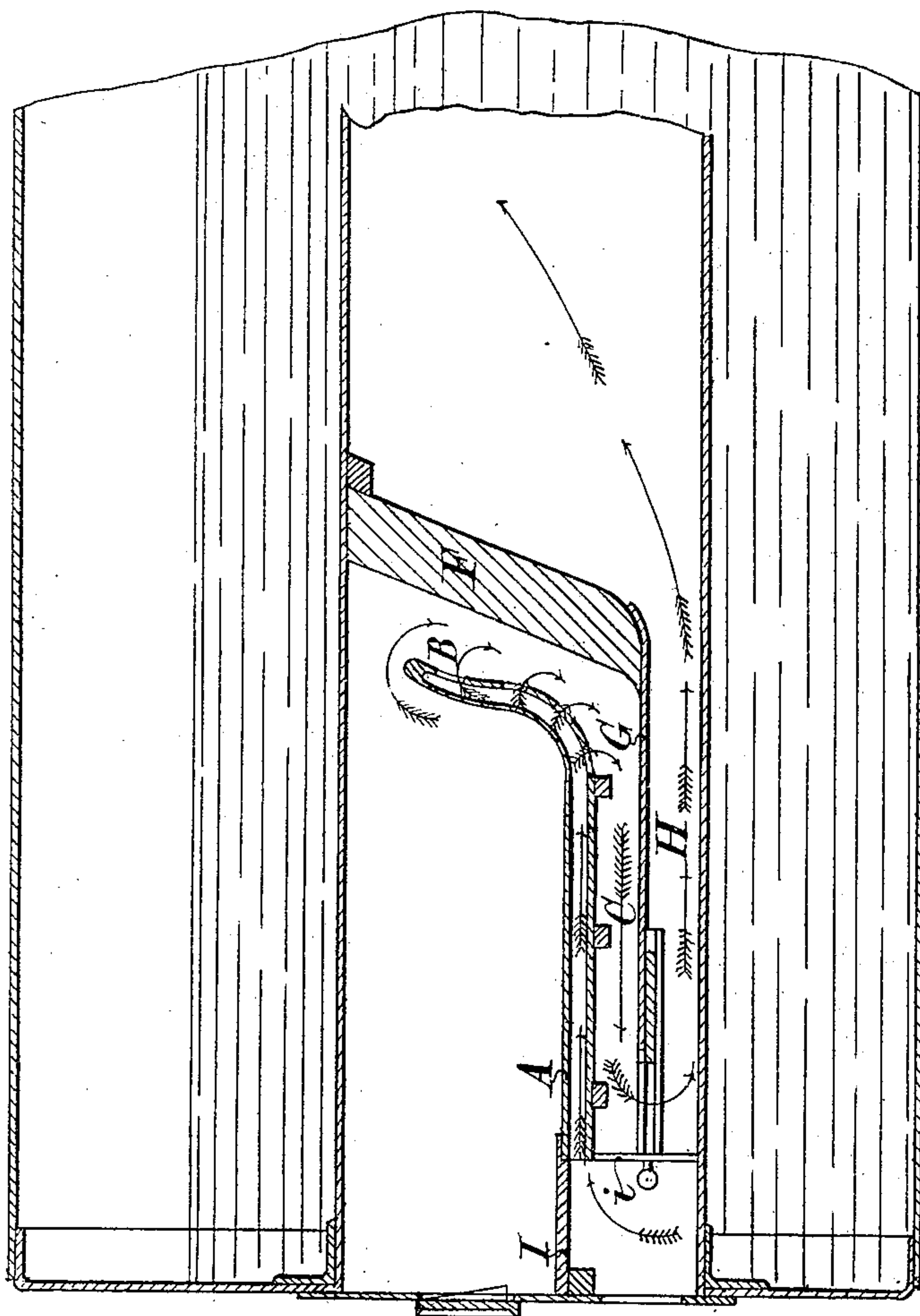
3 Sheets—Sheet 3.

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Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY THOMPSON, OF CANONBURY, LONDON, ENGLAND.

FURNACE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 353,610, dated November 30, 1886.

Application filed August 31, 1885. Renewed October 11, 1886. Serial No. 215,818. (No model.)

To all whom it may concern:

Be it known that I, HENRY THOMPSON, a subject of the Queen of Great Britain, residing at Canonbury, London, England, builder, have invented certain new and useful Improvements in Feeding Air to Furnaces, of which the following is a specification.

My invention relates to improvements in the construction of grates and stoves and of furnaces for steam-boilers and other purposes, whereby the products of combustion, as they escape from the fire, are brought into contact with a supply of highly-heated air, and the said products of combustion and heated air are conducted under the grate to the front of the ash-pit, whence they escape to the flue or flues. By these means the smoke is almost, if not entirely consumed, and the escape thereof to the chimney prevented.

I will now proceed to describe this invention as applied to grates and stoves, such as kitchen-ranges and grates and stoves for sitting-rooms and other domestic purposes.

The front bars of the grate or stove are constructed in any suitable and known manner, and the bottom and back of the fire box or basket are formed of a series of bars, through the entire length, or a portion thereof, of which is an air-passage. Behind those portions of the bars which constitute the back of the fire box or basket is a chamber, which is closed at the top, and at its lower part opens into the back of the ash-pit. When the air-passages through the said bars do not extend beyond the back of the bottom of the fire box or basket, it will be readily understood that the back of the said box or basket may be formed of separate bars. In some cases the air-passages through a number of the bars are of such a size as to admit sufficient air to the chamber at the back of the fire-basket, thereby obviating the necessity of forming air-passages in all the bars. The lower ends of the bars forming the bottom, and in some cases the bottom and back, of the fire box or basket, as hereinbefore mentioned, are situated at the front of the grate or stove, below the front bars, the air-passages through the centers thereof being left open at these ends, and the air traveling through the said passages escapes into the chamber at the back of the fire box or basket through an aperture

or apertures made in each bar at the back of the bottom of the fire box or basket, or in those portions of the bars which constitute the back of the same. The fire box or basket, and also the chamber at the back thereof, are closed at the top by a plate which may be so constructed as to allow of the supply of fresh fuel to the fire; or the fuel may be supplied through the front of the grate. The front of the ash-pit is closed by a door which may be easily opened or removed. The products of combustion pass from the chamber to the ash-pit, and thence through a flue or flues to the chimney. The mouth or mouths of the flue or flues is or are situated near the front of the ash-pit, and in some cases a portion thereof is situated above the bottom of the grate. In applying this part of my said invention to kitchen-ranges and other grates constructed for like purposes, the flue, instead of passing direct to the chimney, may be arranged in close proximity to the ovens, boilers, or other receptacles which it is desired to heat.

When constructing furnaces for bakers' ovens, steam-boilers, and other purposes in accordance with this invention, I form the chamber at the back of the grate by means of a division or partition of fire-clay or other suitable material, which is, by preference, arranged at an angle, as shown in the drawings, and which closes, or nearly so, the space in which the furnace is situated. In some cases the mouth or mouths of the flue or flues are situated near the front in the side of the ash-pit; but in the case of many steam-boilers the said division or partition extends from the top of the space in which the furnace is situated to a point below the bottom of the grate, and to the lower end of the said division or partition I attach a horizontal plate, which extends from the same nearly to the door of the ash-pit, a sliding plate being so arranged that the extent of the space between the horizontal plate and the said door can be regulated, as desired. By these means the ash-pit is divided horizontally.

The doors of the furnace and ash-pit are, when desired, provided with suitable regulators for the admission of air. It is also desirable that the open front ends of the hollow fire-bars be provided with means by which the

admission of air to the interior of the same can be regulated, as will be well understood.

In applying this invention to furnaces it is desirable in most cases to have a dead-plate in front of the fire-bars, and the lower ends of the bars are situated below the said dead-plate. The said ends of the bars and the space in which they are situated are separated by a door from the remainder of the ash-pit, which is constructed as hereinbefore described. When desired, any suitable means may be employed for increasing the supply of air to the said bars, and also to the fuel in the furnace.

In boilers having the ash-pit divided horizontally, as hereinbefore described, the products of combustion and the hot air are conducted from the chamber at the back of the grate under the bottom of the latter to the front of the ash-pit, where they pass below the horizontal plate and through the space between the same and the lower part of the boiler, and under the division or partition to the flue.

I will now proceed to refer to the accompanying drawings, from which the nature of my said invention will be more clearly understood.

The same letters of reference indicate like parts in all the figures.

Figure 1 is a front elevation of a kitchen-range with an oven on each side, and Fig. 2 is a vertical cross-section through the center of the same.

A are the hollow bars; B, the chamber at the back of the grate; C, the ash-pit, and D the mouths of the flues D', leading from the same. The products of combustion pass from the fire and between the bars at the back of the grate into the chamber B, where they come into contact with a quantity of heated air, which escapes into the said chamber from the apertures on the bars A. The whole then travel through the ash-pit to the flues D, and in their passage the smoke is almost, if not entirely, consumed.

In Fig. 1 of the accompanying drawings two flues are shown leading from the respective sides of the ash-pit. They are then arranged

round the ovens, passing under the hot plate, and eventually both open into the flue E, Fig. 2, beneath the floor of the ash-pit, whence they pass into the chimney.

Fig. 3 is a longitudinal section of a furnace which is suitable for heating a baker's oven and other purposes, and Figs. 4 and 5 are respectively a longitudinal section and front view of a steam-boiler provided with two furnaces, Fig. 4 being a section taken through the center of one of the furnaces, and in Fig. 5 the door of one of the furnaces is shown closed, while the door of the other is not shown. F is the division or partition at the back of the chamber B, and G is the horizontal plate extending from the bottom of the division or partition to the front of the ash-pit. The products of combustion pass from the ash-pit through the opening between the door of the same and the plate G into the flue H. The arrows indicate the direction of the products of combustion on their way to the chimney.

Fig. 6 is a vertical section of a steam-boiler furnace, in which a dead-plate, I, is arranged. At the front of the grate is a door, which is in front of the ash-pit, as hereinbefore described.

I claim—

1. The boiler-furnace having the perforated hollow bars A, the chamber B, and the mouth or mouths D, opening into the flue or flues near the front portion of the ash-pit, the top of the grate, stove, or furnace and chamber B being closed, substantially as and for the purposes hereinbefore described and shown.

2. The furnace provided with the hollow bars A, the chamber B, the division or partition F, the horizontal plate G, and flue H, substantially as and for the purposes hereinbefore described and shown.

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