

(No Model.)

2 Sheets—Sheet 1.

J. S. ROBERTS.
FURNACE.

No. 446,539.

Patented Feb. 17, 1891.

Fig. 1.

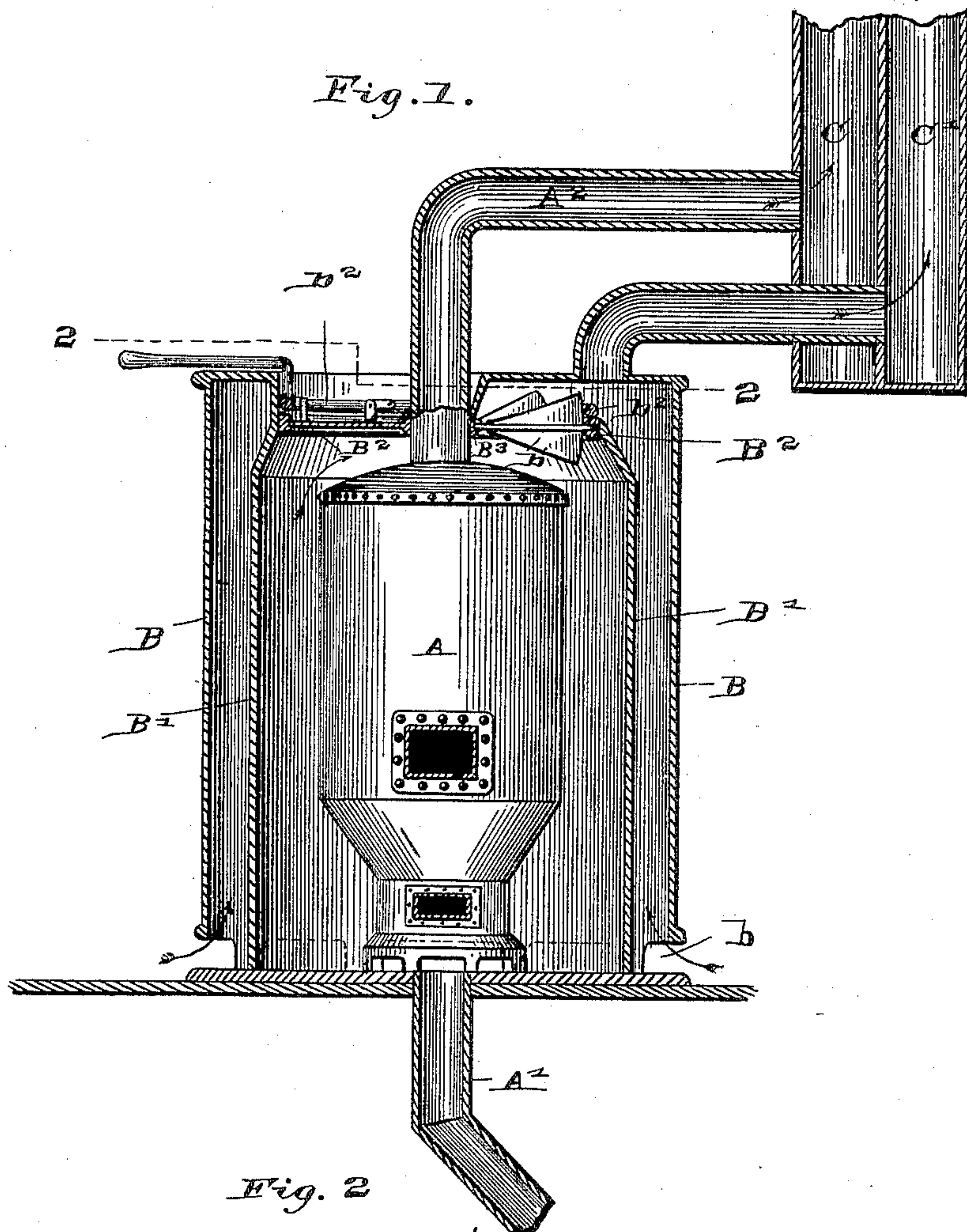


Fig. 2

Fig. 3.

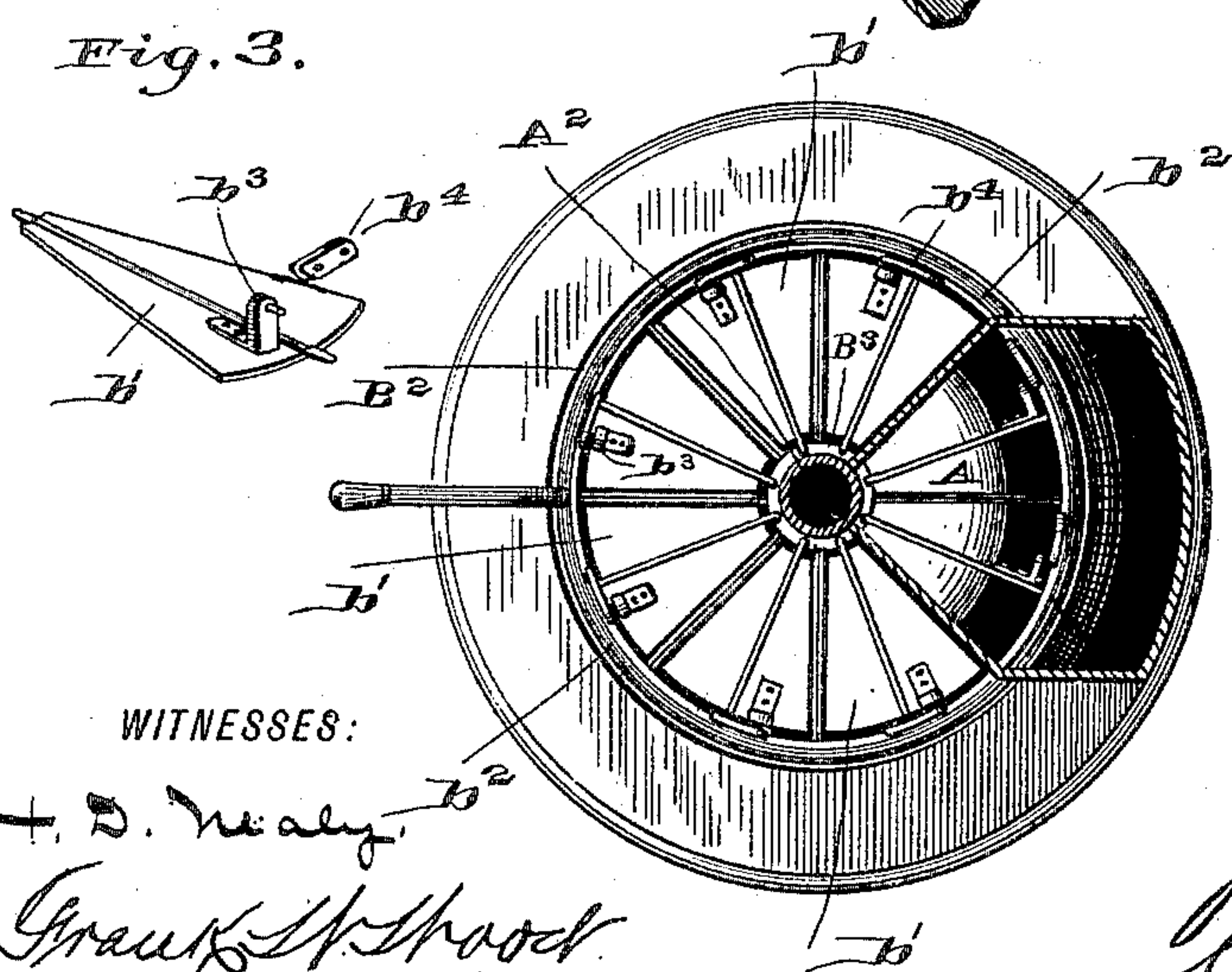
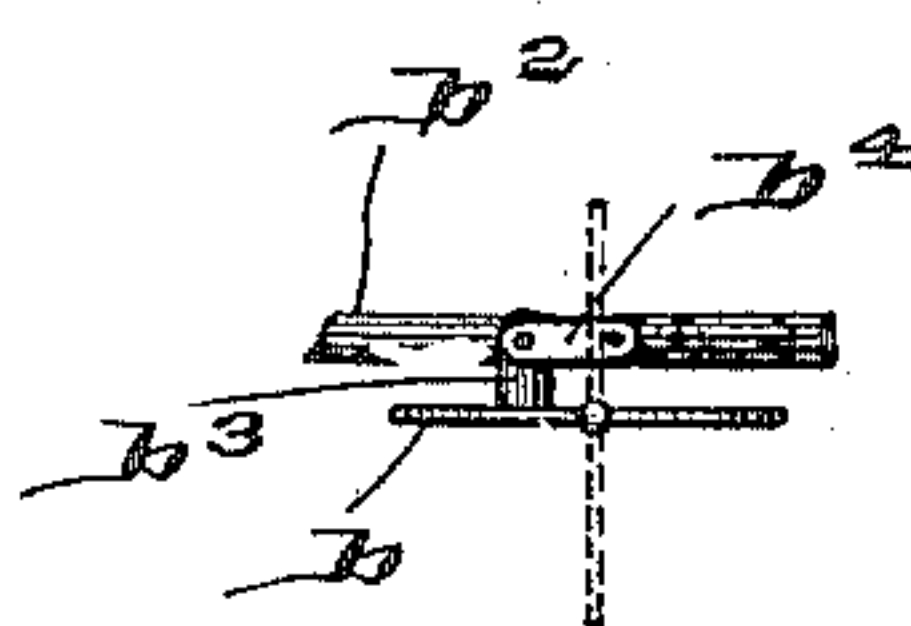


Fig. 4.



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2 Sheets—Sheet 2.

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Fig. 5.

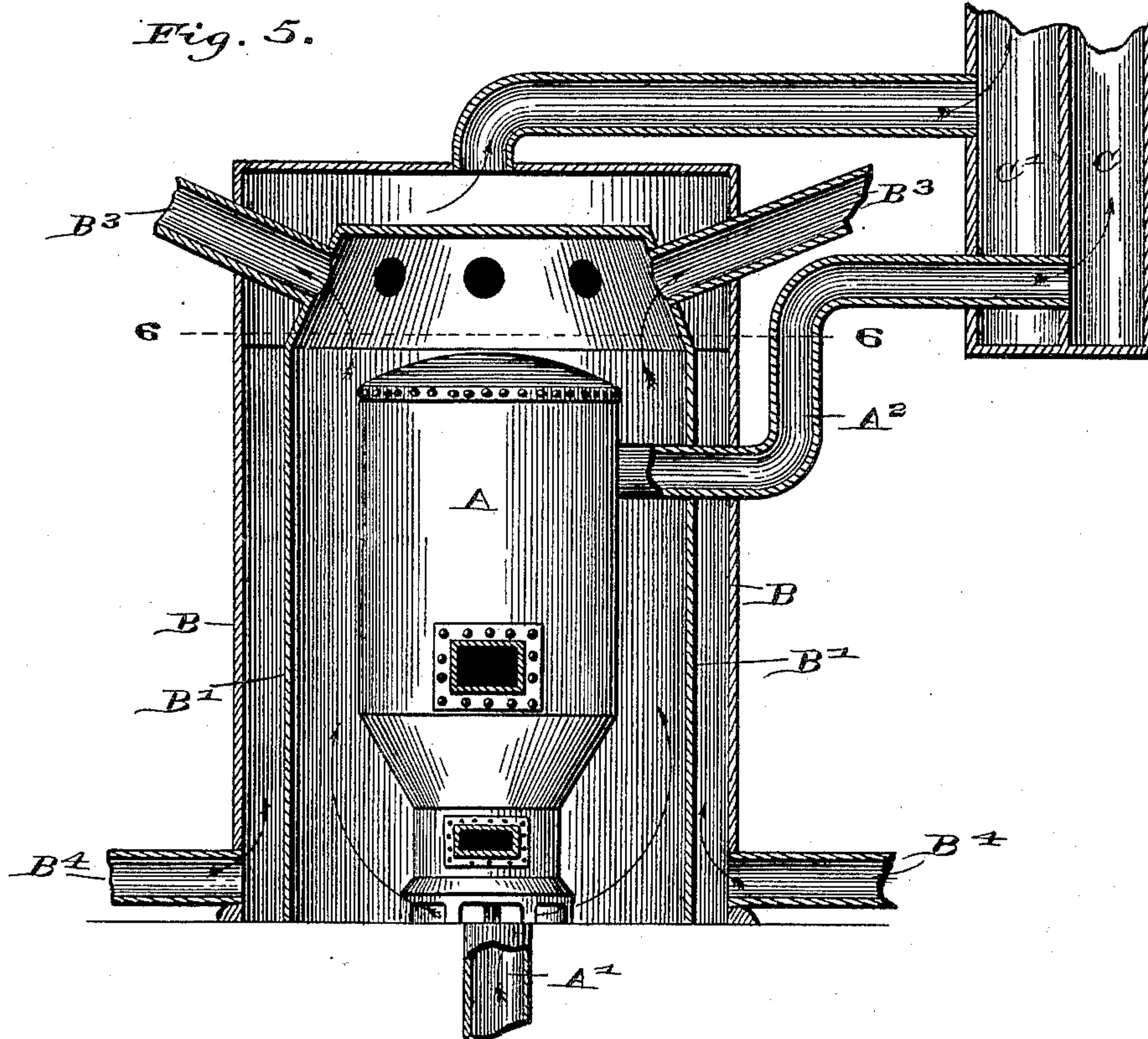
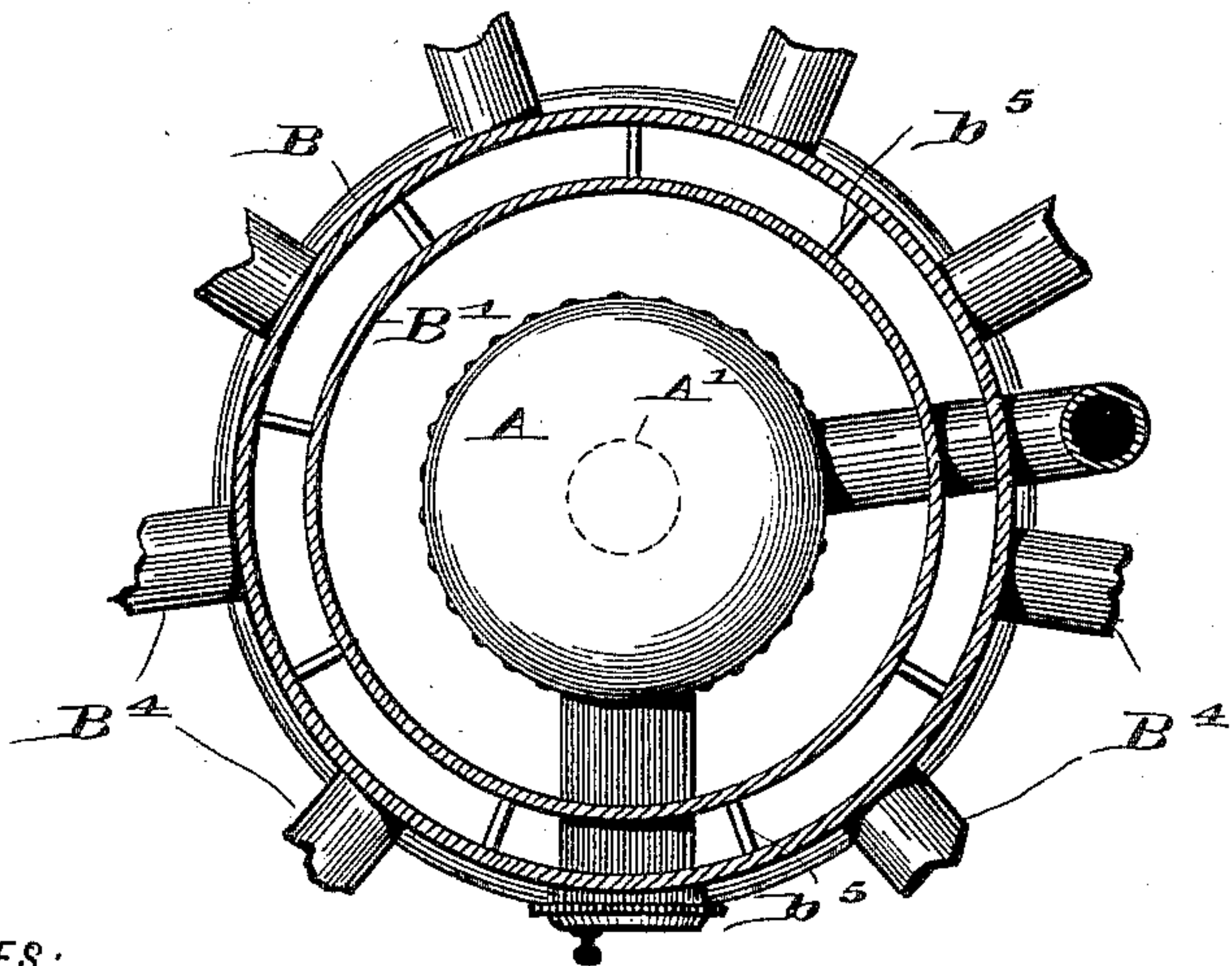


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH S. ROBERTS, OF INDIANAPOLIS, INDIANA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 446,539, dated February 17, 1891.

Application filed June 24, 1890. Serial No. 356,525. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. ROBERTS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

The object of my said invention is to provide a furnace which will not only be an efficient heater, but will also serve to thoroughly ventilate the rooms or building which it is used to heat, as will be hereinafter particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a central vertical section through the furnace-casing, pipes, and flues of a furnace built in accordance with this invention, the fire-box and dome being shown in elevation; Fig. 2, a horizontal view, partly in section, but showing the top of the furnace in elevation, looking downwardly from the dotted line 2 2 in Fig. 1; Figs. 3 and 4, detail views illustrating the arrangement and connection of the valves, as will be presently described; Fig. 5, a view similar to Fig. 1, showing a modified construction; and Fig. 6, a horizontal section looking downwardly from the dotted line 6 6 in Fig. 5.

In said drawings the portions marked A represent the fire-box and dome, B B' the casing surrounding the same, and C C' flues connected with the furnace.

The fire-box and dome A are of any suitable or ordinary construction, located in the center of the structure, being fed by air preferably drawn from the outside of the building through a pipe A', which is arranged with its mouth within the casing. At its top it is connected by a smoke-pipe A² with the flue C, through which the smoke is discharged.

The casing B B' surrounds the structure and is composed of two walls, the outer one B of which has openings b, or a continual open space, around its lower edge, communicating with the room in which it is located. The inner wall B' is located a short distance within the wall B, so as to leave an open space or chamber between them. Said wall B' is extended to the bottom of the furnace, and the chamber between the two casings is

closed at the top, as shown. In the top of said casing is mounted an iron frame or spider B², in which is pivoted a series of valves or wings b', which are all connected to a ring b², by which they are all simultaneously operated, the connection being shown most plainly in Figs. 3 and 4, and consisting of an upright b³, riveted to each of said valves a little to one side of its bearings and provided with a wrist-pin connected to the ring B² by means of a link b⁴. Over a portion of the top of the chamber, within the casing, is extended a continuation of the top of the chamber between the walls B and B', which preferably covers about one-fourth of said top, as shown most plainly in Fig. 2. The valves or wings beneath this covered portion are so attached to the operating-ring as to work in a reverse direction from the others, the connection being placed on the opposite side of the pivot. Thus when the valves outside of the space thus covered are open those beneath the covered portion will be closed, and vice versa.

In the operation of this invention the air to feed the furnace and to supply the warm-air chamber between the fire-box and the casing is drawn from the outside of the building through the pipe A' in the usual and well-known manner, and is discharged into the room in which the furnace is located through the uncovered spaces occupied by the valves b' when said valves are open. At the same time the chamber between the two walls becomes heated, especially at its top, creating a draft from the room thereto and out through the flue C', which draws in the cold and impure air from the under currents in the room and discharges it into said flue C'. Thus the room is not only quickly and efficiently heated, but a continual circulation of the air therein is maintained, the impure air being removed and the pure air from the outside supplied continuously, securing a constantly-changing atmosphere and perfect ventilation. When the room becomes too warm, the valves which communicate therewith are closed, the covered valves being at the same time opened, which permits the hot air in the chamber between the fire-box and casing to pass out through said valves into the flue C'. At the same time the air is drawn from the room and the circulation main-

tained, the cold air being supplied from any source, thus quickly reducing the temperature as desired.

The furnace above described is particularly adapted for use in a room which is to be heated. Where it is desired to use the furnace in the cellar of a building and heat a number of rooms therefrom, pipes leading from the warm-air chamber within the casing to registers in the rooms which are to be heated will be added to the structure, and the top of said warm-air chamber can be inclosed by an imperforate top, instead of by the system of valves. Such a construction is shown in Figs. 5 and 6, the pipes B³ illustrating the arrangement by which the heat is taken to the rooms, and pipes B⁴ the arrangement by which the cold air is drawn from the rooms, said pipes being connected to other registers in the rooms from which the air is to be drawn, which are similar in construction to the ordinary register covering the mouth of the heating-pipe. As will be readily understood, this arrangement secures a perfect circulation of the air in substantially the same manner as is secured in the construction shown in Fig. 1. Should it be desired, a valve or valves, as shown in Figs. 1 and 2, can be provided in the top of the casing of the construction shown in Fig. 5, which can be opened when the registers in the rooms are closed to permit the hot air within said chamber to exhaust through the ventilating-flues, as will be readily understood. The chamber between the two walls B and B' in both forms is preferably divided by vertical partitions b⁵, which extend to near the top of the inner wall, thus forming vertical flues from the bottom to the open space at the top. By this arrangement the current of air is maintained in a vertical direction, and in the form shown in Figs. 5 and 6 the current from one pipe is not permitted to interfere with the current from another pipe until it has reached the top of the chamber. Instead of these portions, short pipes can be used without departing from my invention.

In the drawings a sheet-iron furnace is illustrated; but, as will be readily understood,

the walls can be made of brick or any other material, if desired.

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

1. The combination, in a furnace, of the fire-box surrounded by a casing composed of two walls with a space between them, the inner wall extending to the bottom of the furnace and the outer wall being provided with openings communicating with the outer air, a ventilating-flue connected with the top of the chamber formed by the space between the two walls; and valves provided in the top of the chamber inclosed by the inner wall, which chamber communicates directly with the room to be heated, substantially as set forth.

2. The combination, in a furnace, of the fire-box, a casing surrounding said fire-box, composed of two walls with a space between them, the outer wall being provided with air-inlet openings, and the chamber inclosed by the inner wall being provided with a top having a series of valves, a portion of said valves communicating with the room in which the furnace is located and a portion with the chamber formed between the two walls of the casing, and the ventilating-flue communicating with said chamber, substantially as set forth.

3. The combination, in a furnace, of the fire-box and the double-walled casing inclosing the same, the top of the chamber in said casing being provided with a series of valves, a portion of which communicate with the room and a portion with the chamber between the two walls, which portion is connected to the operating mechanism to be operated reversely from those communicating with the room, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 19th day of June, A. D. 1890.

JOSEPH S. ROBERTS. [L. S.]

Witnesses:

E. W. BRADFORD,
F. W. WOOD.