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PATENTED SEPT. 8, 1908.

H. J. HOUGH, A. J. DIETRICH & W. F. BRUNSWICK.

STOVE AND FURNACE.

APPLICATION FILED JUNE 26, 1907.

2 SHEETS—SHEET 1.

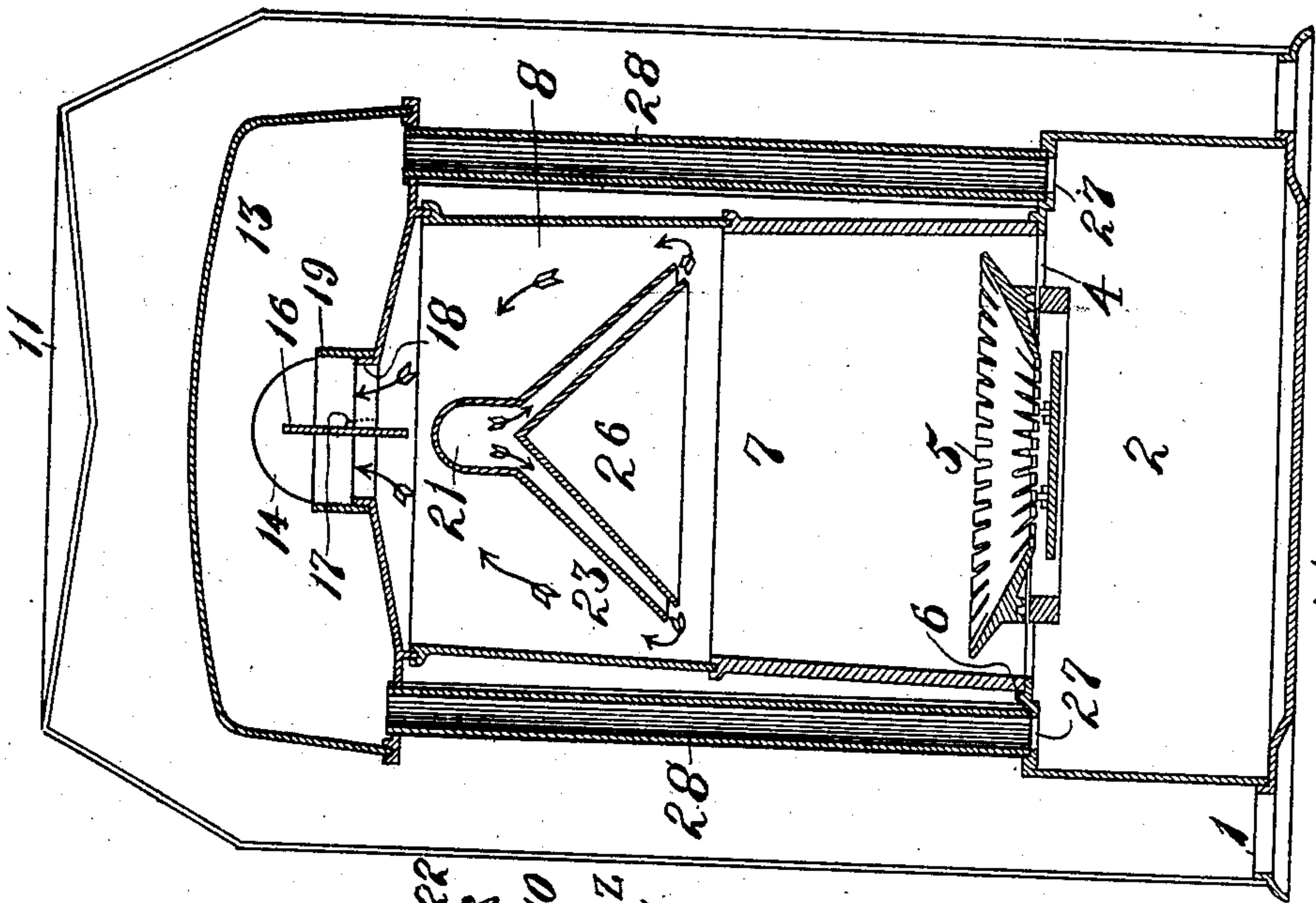


Fig. 2

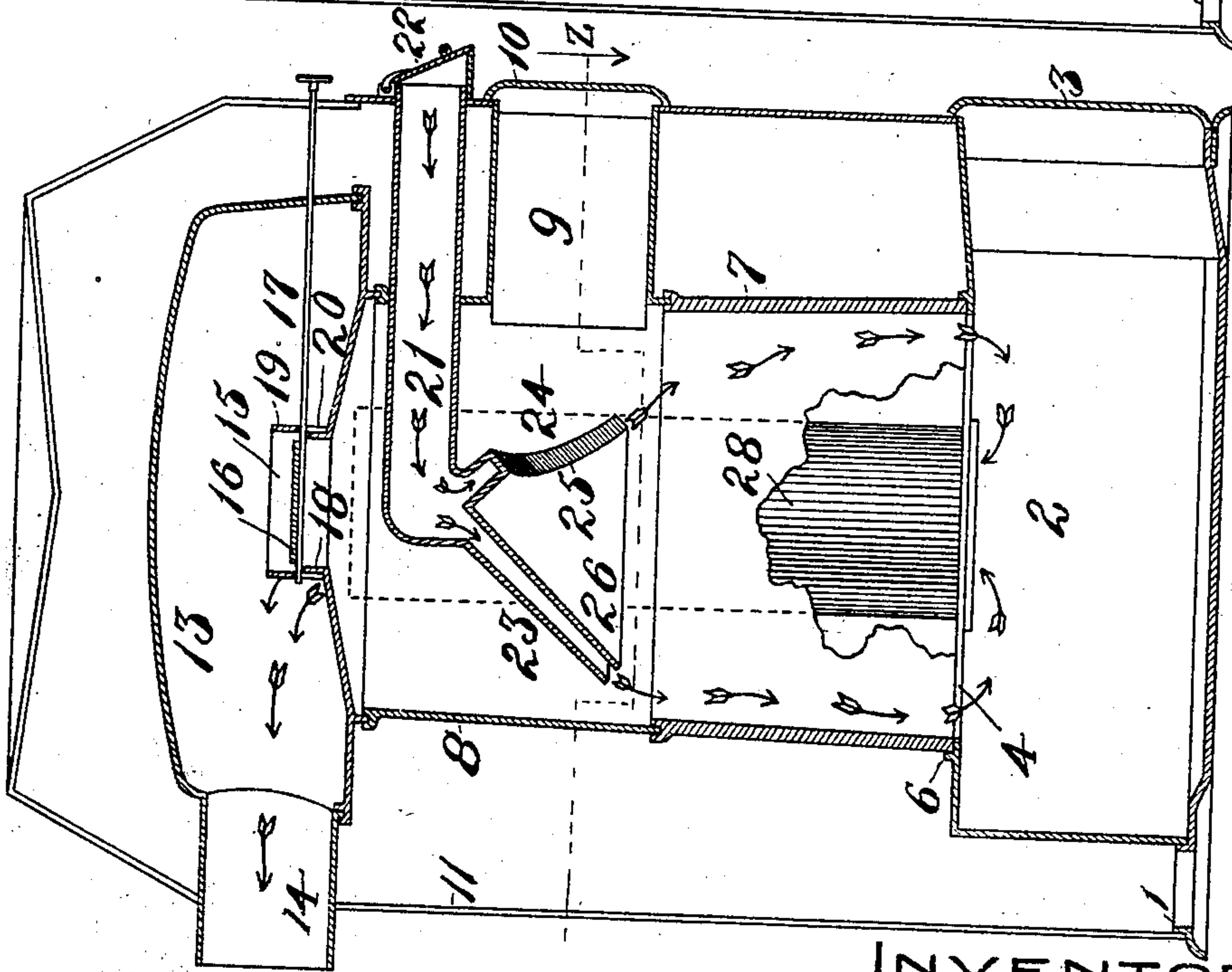


Fig. 1

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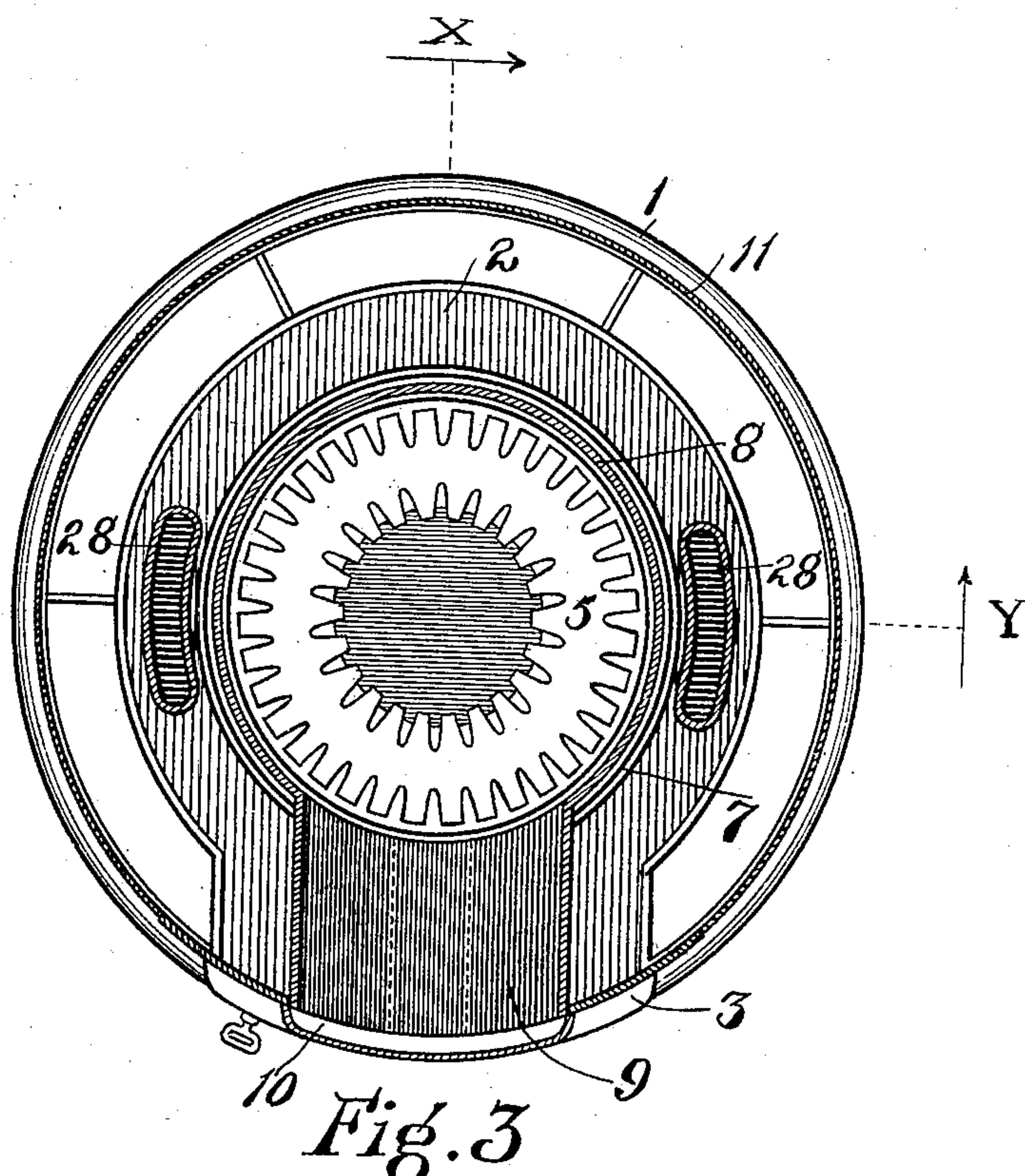
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UNITED STATES PATENT OFFICE.

HIRAM J. HOUGH, ANTHONY J. DIETRICH, AND WILLIAM F. BRUNSWICK, OF AKRON, OHIO.

STOVE AND FURNACE.

No. 898,367.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed June 26, 1907. Serial No. 380,930.

To all whom it may concern:

Be it known that we, HIRAM J. HOUGH, ANTHONY J. DIETRICH, and WILLIAM F. BRUNSWICK, citizens of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Stoves and Furnaces, of which the following is a specification.

This invention relates to stoves and furnaces and the primary object thereof is to so construct the same that it will be comparatively inexpensive to make, easily controlled and economical in use.

In order to make this device particularly economical in the consumption of fuel and to obtain the greatest amount of heat from a given consumption, the invention contemplates so arranging the device that the most intense combustion will occur in close proximity to the walls of the combustion chamber, in order that the greater heat thereby generated may be transmitted through said walls to the exterior air surrounding the heater portion of the device.

In order to accomplish the foregoing object this device is provided with certain new and novel mechanism hereinafter more fully described, whereby fresh air may be fed to the combustion chamber above the mass of consuming fuel and be there distributed to ignite or commingle with the gases from the fuel in close proximity to the walls of the fire-pot and from thence the products of combustion will be carried downwardly around and partially through the burning fuel to the ash-pit, afterwards ascending through extraneous flues separated from the heater portion of the device to the dome thereof, from whence they escape by an off-take flue, by which means not only the fire-pot but the ash-pit and extraneous flues will themselves constitute heating instrumentalities for the diffusion of heat to the air surrounding the device, thus gaining a greater heating surface than it is ordinarily practicable to obtain in a device of this character.

Other advantages constituting objects of this invention will more fully appear in the subjoined description in which similar reference numerals indicate like parts in the different figures.

In the drawings, Figure 1 is a vertical, central section of a furnace on line X of Fig. 3; Fig. 2 is a view similar to Fig. 1 on line Y of Fig. 3; and, Fig. 3 a transverse section on line Z of Fig. 1.

The drawings show and the description is confined to a heating furnace to which this invention primarily appertains, but it will be stated that it is equally applicable to a stove and may be applied thereto with equal efficiency and still be within the scope of this invention.

In the drawings, the reference numeral 1 designates a base ring on which is an ash-pit 2 provided with a door 3. This ash-pit 2 is further provided with an opening in its upper portion, referred to in the drawings by the reference numeral 4. Approximately within this opening is a grate 5 which may be of any preferred construction suited to the kind of fuel used in the device, or the shape of the combustion chamber with which the same is associated. Surrounding the opening 4 is an approximately annular seat 6 in which is mounted a frusto conically-formed fire-pot 7 supporting a fuel section 8 provided with a fuel pouch 9 adapted to be closed by a door 10. Inclosing the structure hereinbefore described is an outer casing 11 which may be of the usual type employed in devices of this character. Mounted on the fuel section 8 is a dome shaped member 13 consisting of an enlarged body portion provided with an off-take flue 14. The bottom portion of this dome 13 is adapted to constitute a cap for the fuel section 8 and has through its central portion an opening 15 provided with a damper 16 operated by means of a handle 17 extending outside of the casing 11.

In order to retain the damper 16 in position and permit it to be horizontally rotated so that the damper rod 17 may project through the casing 11 at any convenient place, the rod 17 is adapted to lie on the top of a flange 18 which surrounds the opening in the flue of the dome 13. Surrounding this flange 18 is a sleeve 19 having upwardly-extending slots 20 arranged to straddle the rod 17 and constitute in connection with the top of the flange 18 a journal bearing for the rod 17, so that whenever for any reason the rod 17 is horizontally moved the sleeve 19 will move with it and always constitute a bearing for the rod.

Extending from the exterior of the casing 11 into the interior of the combustion chamber is a cold air inlet 21 provided with a door 22 outside of the casing for controlling the inlet of air thereto. The inner end of the cold air inlet 21 is provided with a conical

spreader 23 which may be made integral with the inlet 21 or separately, as desired. This spreader consists of a pair of approximately-parallel cones spaced apart from each other to constitute a conical passage for the air carried in by the inlet 21. In order that this spreader 23 may not interfere with the placing of fuel in the combustion chamber through the pouch 9, a part of the spreader, designated in the drawings by the reference numeral 24 is cut away and the two cones are preferably connected together by a member designated in the drawings by the reference numeral 25, so that by this means the inner cone 26 is supported in proper relation with respect to the outer cone and the thin stratum of air which is projected from the spreader will not be directed towards the fuel pouch, thereby avoiding the liability of smoke escaping from the door 10 when it is open. It will be noted that the lower edges of this cone are separated so that air may escape from the inlet 21 in all directions, excepting towards the fuel pouch 9; and as the air leaves the space between the cones 23 it will be directed towards the side walls of the combustion chamber and there intermingle with the gases resulting from the combustion of the fuel and increase the intensity of the flame and produce greater heat directly against the walls of the device. In the top of the ash-pit 2 are a plurality of openings 27 outside of the annular seat 6 on which the fire-pot rests, and surrounding these openings 27 are annular seats in which are mounted upwardly-extending flues 28 which enter the dome shaped member 13, so that any products of combustion in the ash-pit may escape directly to the dome 13.

The operation of this device is as follows:— In starting the fire with fresh fuel the damper 16 is turned in the position shown in Fig. 2 and the door 22 opened or closed as desired. Before the fuel is ignited, the door 3 of the ash-pit is opened and the air will pass up through and around the grate 5 and from thence upwardly through the opening inclosed by the flange 18 of the dome 13, and from thence through the off-take flue 14.

The damper 16 is kept in the position just described until the fire is well started, then it is closed and the door 22 opened, if it has been kept closed, and air entering through the inlet 21 will pass downwardly between the walls of the spreader 23 and intermingle with the gases of the fuel adjacent the walls of the fire-pot, and from thence pass around and through the fuel to the ash-pit, from whence it escapes by means of the flues 28 to the dome 13 and out by the off-take flue 14, the passage of air in the latter instance being illustrated by the arrows in Fig. 1.

From the foregoing it will be seen that a thorough distribution is made of the air admitted to the fire-pot through the cold air

inlet 21 and that the most intense combustion will take place against the walls of the fire-pot, whereby the walls of the fire-pot are much more intensely heated than if the combustion took place in the more central portions thereof. From this it will be seen that greater efficiency may be derived from this device with a smaller amount of fuel.

What we claim and desire to secure by Letters Patent, is:—

1. The combination with a stove or furnace provided with an ash-pit, a combustion chamber mounted on said ash-pit, and a fuel pouch extending from the outside of the furnace casing to within the combustion chamber, of an air distributing member positioned within said combustion chamber in front of the inner end of said pouch comprising a pair of superimposed conical-shaped imperforate plates disconnected at their lower ends thereby providing an air outlet, a portion of said plates being cut away immediately in front of the inner end of said pouch, whereby fuel fed to said combustion chamber through said pouch will have an uninterrupted entrance therein, means for connecting the edges of said cutaway portions together, and means merging into the apex of the outer plate for conveying air from the exterior of the furnace casing to said air distributing member.

2. A device of the class described comprising an ash-pit provided with a plurality of openings in its top, a combustion chamber mounted on said ash-pit in open communication with one of said openings, a fuel pouch communicating with said chamber a dome shaped member mounted on said combustion chamber provided with an opening in its base for establishing communication between the interior of said member and said combustion chamber, a damper to close said opening, an air distributing member positioned within said combustion chamber in front of the inner end of said pouch comprising a pair of superimposed conical-shaped imperforate plates disconnected at their lower ends thereby providing an air outlet, a portion of said plates being cut away immediately in front of the inner end of said pouch, whereby fuel fed to said combustion chamber through said pouch will have an uninterrupted entrance therein, means for connecting the edges of the cutaway portions of the plates together, a flue extending from the ash-pit to said dome shaped member in open communication with both, whereby when said air inlet is open for the admission of air and said damper closed, the products of combustion will pass through said combustion chamber downwardly to said ash-pit and upwardly through said flue to said dome shaped member, means merging into the apex of the outer plate for conveying air from the interior of the furnace casing to

said air distributing member and an off-take flue arranged for the escape of the products of combustion from said dome shaped member.

5 3. The combination with a stove or furnace provided with an ash pit, a combustion chamber mounted thereon and a fuel pouch communicating with the said chamber, of an
10 air distributing member disposed within said chamber in front of the inner end of said pouch and comprising a pair of conical-shaped spaced plates disconnected at their lower ends thereby providing an air outlet, a portion of each of said plates being cut
15 away immediately in front of the inner end of said pouch whereby fuel fed to the combustion chamber will have an uninterrupted

entrance therein, means for connecting the edges of the cutaway portions together, and a laterally-extending conduit merging at its inner end in the apex of the outer plate, said conduit adapted to convey air from the exterior of the furnace casing to said distributing member.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HIRAM J. HOUGH.
ANTHONY J. DIETRICH.
WILLIAM F. BRUNSWICK

Witnesses:

C. E. HUMPHREY,
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