No. 751,530. PATENTED FEB. 9, 1904.

R. A. MAY.

CONVERTIBLE FURNACE.

APPLICATION FILED MAR. 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

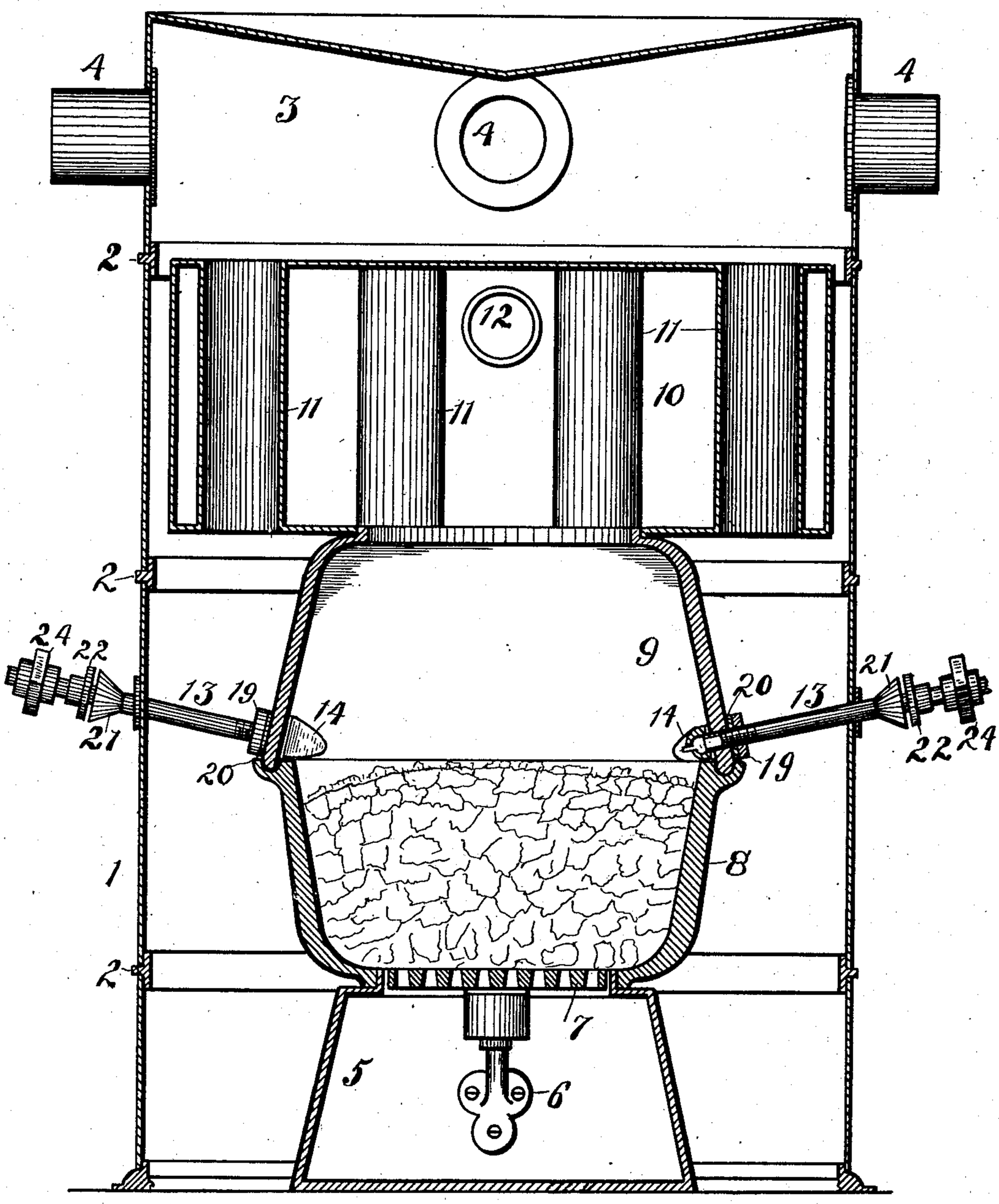

Fig. 1.

Witnesses:
Maude Grisler.
Walter Bowman

Inventor:
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NO MODEL. 2 SHEETS—SHEET 2.

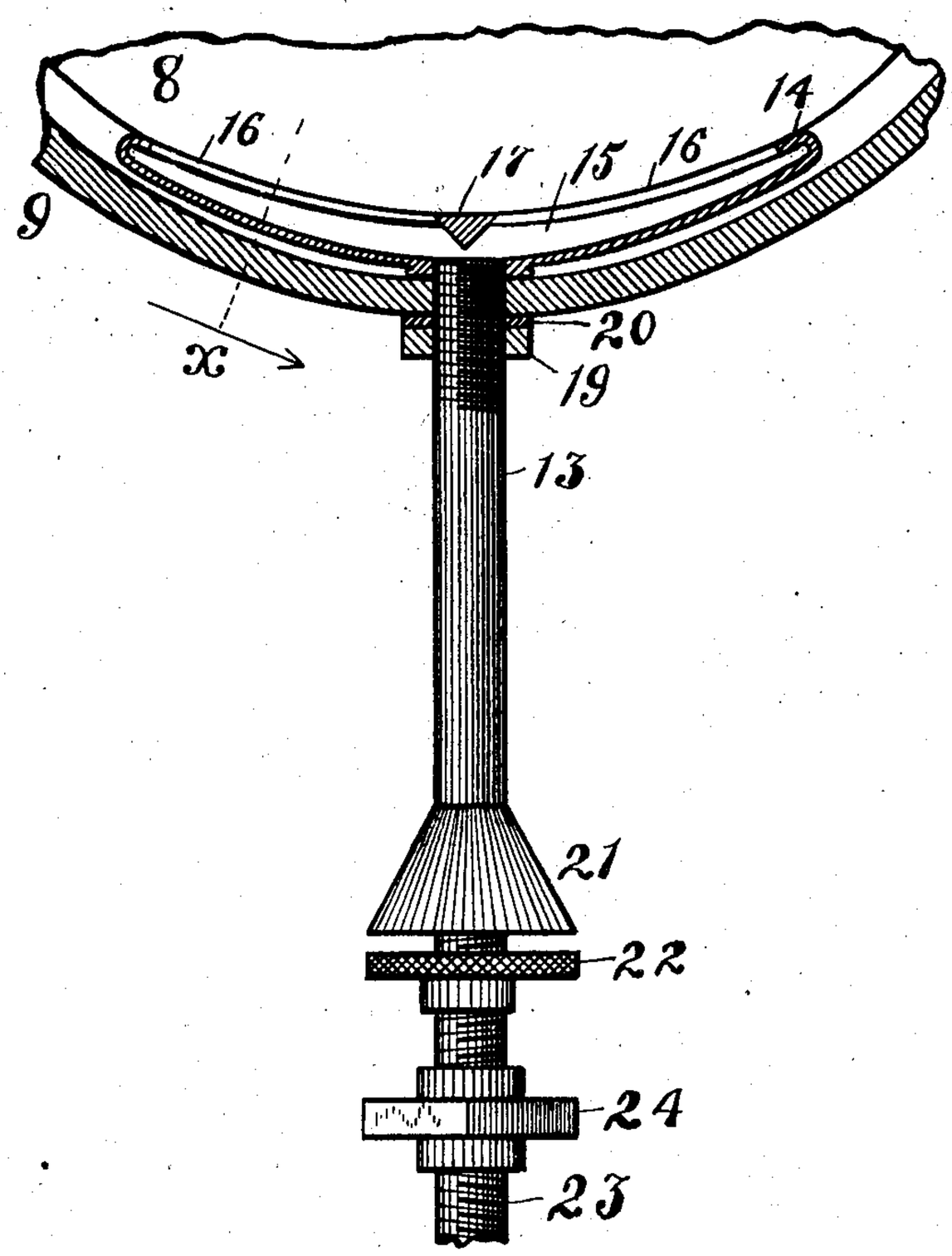

Fig. 2

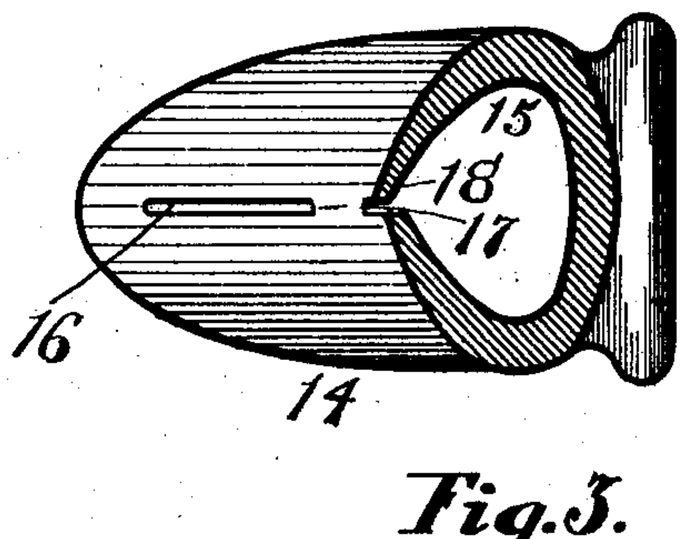

Fig. 3.

Witnesses:
Wande Grisler.
Walter Bowman.

Inventor:
Rudolph A. May.
By C. C. Humphrey.
Attorney.

No. 751,530. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

RUDOLPH A. MAY, OF AKRON, OHIO.

CONVERTIBLE FURNACE.

SPECIFICATION forming part of Letters Patent No. 751,530, dated February 9, 1904.

Application filed March 2, 1903. Serial No. 145,824. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH A. MAY, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Convertible Furnaces, of which the following is a complete specification.

My invention has relation to means for supplying to an ordinary solid-fuel-burning stove, furnace, or other heating apparatus such devices as will permit the burning therein of some fluid fuel without rendering the stove or furnace incapable of use with solid fuel.

The object of my invention is to place within the combustion-chamber of an ordinary solid-fuel-burning stove, furnace, or similar device appliances by which the ordinary use of a fluid fuel may be accomplished and yet permit of the burning therein of any common solid fuel when for any reason the supply of fluid fuel becomes exhausted or is temporarily shut off.

In those communities where natural gas is largely used as a fuel for lighting and heating it frequently happens that for some reason or other the supply of gas is arrested for intervals, from which result inconvenience and discomfort, which it is my object to obviate as far as possible.

It is also one of my objects in this invention to supply a burner for the fluid fuel by which the distribution of the flame within the combustion-chamber is as perfect as can be obtained, to the end that complete combustion of the fuel may take place and the heat be distributed as evenly and perfectly as possible.

Another object is to provide a burner which is comparatively cheap and whose renewal may be easily accomplished and one in which ashes resulting from the combustion of solid fuel would in no wise tend to clog or impair the legitimate operation of the fluid-fuel burner.

To the accomplishment of the aforesaid objects, my invention consists in the novel and peculiar construction, arrangement, and combination of parts hereinafter described and then specifically claimed, reference being had to the accompanying drawings, forming a part hereof.

In the drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a central section of a portable casing-furnace in which my improved fluid-burner and its connected parts are in position for use. Fig. 2 is an enlarged detail of my improved fluid-burner and connected parts; and Fig. 3, a section at the line *x* of Fig. 2, showing only a section of the burner detached.

In the drawings, 1 is an outside shell or casing of a furnace, which is taken as a means of illustrating the operation of my device, which may be of any of the well-known forms and consists of a series of cylinders of sheet metal held together by rings 2, surmounted by a dome 3, from which the hot-air pipes 4 extend to the apartments which are to be heated by the furnace.

The stove or furnace proper consists of an ash-pit 5 at the base of the casing 1, and within the ash-pit 5 and fastened thereto is a bracket 6, upon which is suspended or sustained a grate 7 of any construction desired. Mounted upon the ash-pit 5 is a fire-pot 8, within which is shown a supply of solid fuel. Upon the fire-pot 8 is a dome of the fire-pot 9, the two constituting the combustion-chamber, and upon this rests the radiator 10, consisting of uptake-pipes 11, through which the air from the lower portion of the furnace-casing 1 passes upward to the dome 3 to be heated in its progress. From the radiator 10 leads a chimney or flue 12 for the products of combustion to pass out.

Thus far the description will apply substantially to any of the well-known forms of furnace, and as my invention is applicable to any furnace or stove no peculiar or particular design of furnace has been attempted in the drawings.

Through the dome 9 or the fire-pot 8 and generally above the normal level of the solid fuel I bore as many holes as I desire to place burners for fluid fuel within the combustion-chamber, and through these holes I place intake-pipes 13 through the casing 1 of the furnace, if the invention is to be applied to a furnace, and if to be applied to a stove simply through the shell of the stove. The inner

ends of the pipes 13 are threaded and are intended to engage threads on the interior of the burners 14 and retain the burners in place against the inner side walls of the combustion-chamber. The burners each consist of a long hollow box 15, the curvature of which is substantially coincident with the interior curve of the combustion-chamber of a stove or furnace. Along the front inner edge of this box-like burner are two slits 16, divided by a partition or deflector-plate 17, which is substantially wedge-shaped with a view to diverting the gas entering the burner and spreading it to cause as far as possible the gas to issue from the slits 16 in a thin even stream. From the rear and directly opposite the wedge-shaped partition 17 is a threaded opening into which the intake-pipe 13 is to be secured. In making this burner I prefer to make the upper edge 18 of the slit 16 extend outwardly over the lower edge of the slit, with a view to preventing the deposit of ashes in the slit when the fluid fuel is not in use and common solid fuel is being burned in the stove or furnace. On the end of the pipe 13 which is designed to enter the combustion-chamber is a nut 19 and also an asbestos washer 20, so that when the induction-pipe 13 has been screwed into the threaded opening of the burner 14 sufficiently firmly to sustain it in place the lock-nut 19 may be screwed up against the outside surface of the combustion-chamber with only the abestos washer intervening to make as tight a joint as possible. On the outer end of the pipe 13 is an ordinary mixer 21, which may be of any of the well-known forms of mixers for fluid fuel provided with a shut-off 22, by which the amount of air mixed with the fluid fuel may be determined. Also on the end of the pipe 13, connecting it with the main supply-pipe 23, is a union or coupling 24 to permit of the ready detaching of the induction-pipe 13 from the main supply-pipe 23.

It is of course obvious that shut-off cocks and similar fluid-fuel-controlling devices may be placed in each of the supply-pipes leading to the burners 14; but it is not thought necessary in the drawings to illustrate them, as the invention does not necessarily contemplate their use. In placing these burners within the combustion-chamber of an ordinary stove or furnace any number may be used which experience decides to be necessary for the proper heating thereof, and their position therein may be such as will be most convenient and serviceable. I prefer in placing the induction-pipes 13 in the side walls of the combustion-chamber to slightly incline them, with a view to throwing the flame issuing therefrom in a downward direction to afford as far as possible the most complete combustion of the gas and spread the heat incident to this combustion over as large an area in the chamber as is possible. In making this burner 14 for rectangular or straight-sided combustion-chambers the curve of the body of the burner can be flattened, so as to conform as far as possible to the general contour of the interior of the chamber in which the burner is to be used.

The operation of this device is as follows: Where a fluid fuel is the common fuel employed, the fluid fuel is turned into the chamber through the induction-pipes 13 and burners 14 and ignited in the ordinary manner. Should for any reason the fluid fuel fail or be temporarily arrested, a fire of common solid fuel is built on the grate 7 and the supply of fluid fuel arrested by cocks or similar devices. Any ashes that may arise from the combustion of the solid fuel are diverted from entering the slits 16 in the burners 14 by reason of the overhanging upper edge 18, and if even with this precaution fine particles of dust should enter the burner the return of the fluid fuel will blow them out, thereby cleansing the burner.

The fact that the burners 14 are adjacent to the heat of the solid fuel may cause them in time to be destroyed, and their renewal is readily accomplished by unscrewing the induction-pipe 13, which is permitted by the union-joint 24, and a new burner, which can be had at a low cost, is held within the combustion-chamber and the induction-pipe 13 screwed into it, as in the first instance.

It is entirely within the scope of my invention to utilize this invention to heat the interior of an annealing-oven for steel, iron, or glass and analogous products.

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

The combination with the combustion-chamber of a stove or furnace normally adapted for burning a solid fuel, of a burner shaped to conform to the interior of the combustion-chamber and to be placed against its inner side walls provided on its inner face with a slot, the upper portion of said burner above said slot arranged to overhang the portion of said burner below said slot, and means for introducing a fluid fuel into the interior of said burner.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

RUDOLPH A. MAY.

In presence of—

MAUDE ZWISLER,

C. E. HUMPHREY.