

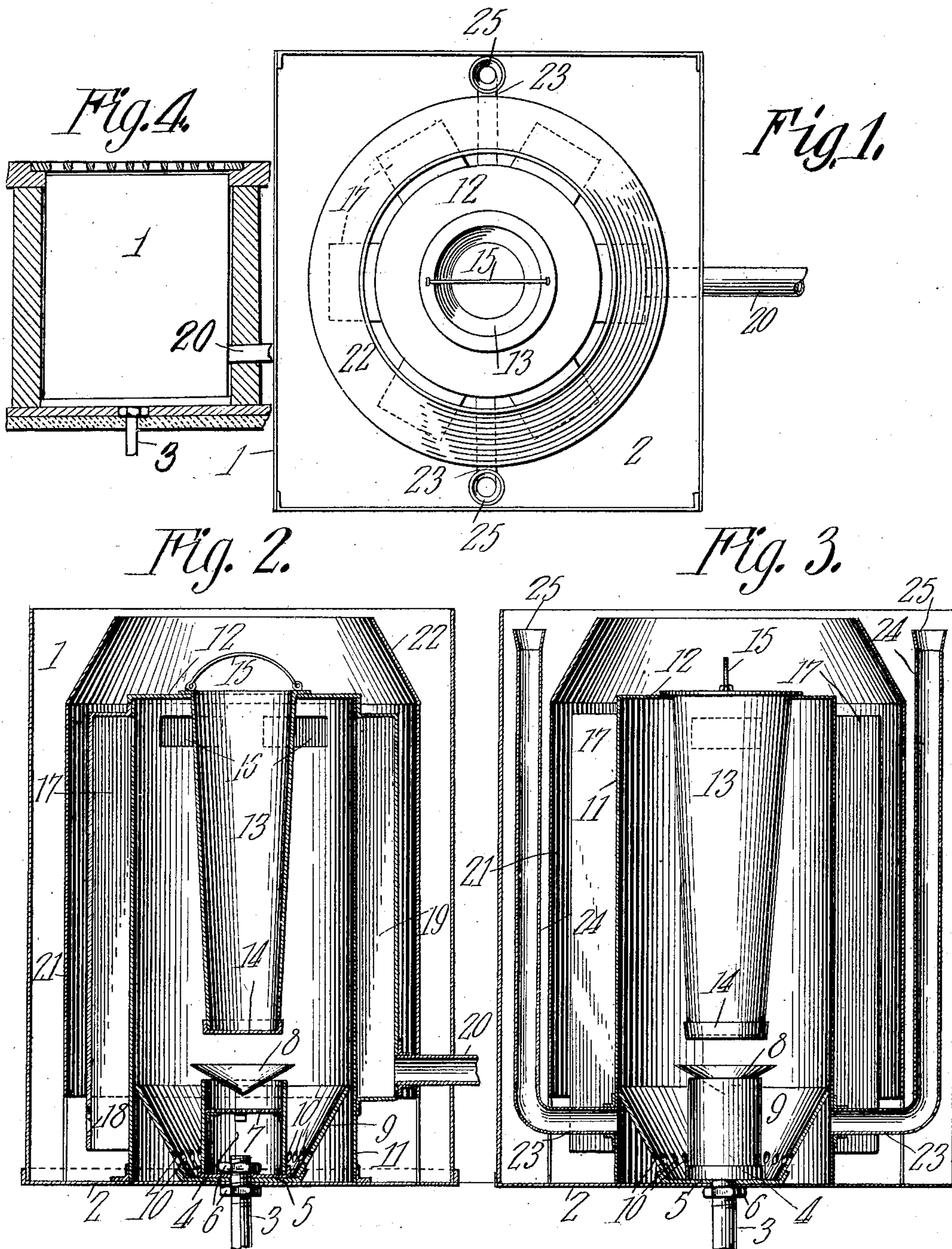
No. 887,915.

PATENTED MAY 19, 1908.

W. H. BURK.

HEATER.

APPLICATION FILED APR. 30, 1907.



WITNESSES:

E. J. Hunt
F. J. Chapman

William H. Burk, INVENTOR.

By *C. A. Snow & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM H. BURK, OF FOSTORIA, OHIO.

HEATER.

No. 887,915.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed April 30, 1907. Serial No. 371,065.

To all whom it may concern:

Be it known that I, WILLIAM H. BURK, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented a new and useful Heater, of which the following is a specification.

This invention has reference to improvements in heaters of the hot-air type, and is designed more particularly for use in floors, so that each heater is a unit and no common, distantly-located heating device is needed. By this means each heater may be located at any convenient point in a floor and gas or alcohol or other suitable locally-applied burning fluid may be used.

The invention comprises means for preventing the burning fluid from being extinguished by drafts created by the opening and closing of doors in the building in which the heater is located. Also, means are provided for supplying air from the floor above to the burner located under the floor, and also the invention comprises means whereby access to the burner for lighting or extinguishing purposes or for other purposes is rendered easy.

The invention will be fully understood from the following detailed description, taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a top plan view of the floor heater; Fig. 2 is a vertical section diametrically through the same in line with the exhaust flue; Fig. 3 is a similar section at right angles to that taken in Fig. 2. Fig. 4 is a section through the flooring between an upper and lower room showing the floor heater in place between the floor of the upper room and the ceiling of the lower room.

Referring to the drawings, there is shown a casing 1 which may be open at the top and provided with a bottom 2. This casing is shown in the drawings as rectangular in cross section but it may be otherwise shaped if so desired. Passing centrally through the bottom 2 is a fuel supply pipe 3 for gas or liquid. This pipe 3 enters a cup-shaped burner 4 resting on a plate 5 interposed between the bottom of the burner and the bottom 2 of the heater body 1. The pipe 3 may be secured by nuts 6 below the bottom 2 and above the bottom of the burner 4. A gauze diaphragm 7 is secured in the burner and its

upper end is partially closed by a spreader 8 in the form of an inverted cone. Mounted on the plate 5 is an inverted frusto-conical sleeve 9 extending upward to a point about the height of the burner body 4 and having about midway of its height a circumferential series of perforations 10.

Surrounding the burner and of a size to just receive the sleeve 9 is a cylinder 11 fast at its lower end to the bottom 2 of the case 1 and extending to a point a little below the upper end of said case. This cylinder 11 is closed at the top by an annular plate 12 through the central hole of which there is inserted into the cylinder 11 a slightly tapering tube 13, closed at the bottom as shown at 14 and serving to spread the flame coming from the burner 4 against or toward the cylinder or drum 11. The tube 13 is provided with a bail 15 by means of which it may be lifted out of the drum 11 through the top of the casing 1 in order that the burner may be reached for lighting or other purposes. Near the top of the drum 11 are a number of openings 16 communicating with downwardly extending flues 17 which reach nearly to the bottom of the drum 11 exterior thereto and are there provided with outwardly-directed openings 18. These flues 17 are arranged around the drum at appropriate distances apart and one of them is replaced by another like flue 19 communicating at its bottom with an escape flue 20 for the burned gases of combustion which may be led thereby to the outside of the building or into an appropriate chimney.

Surrounding the drum 11, which for convenience I may call the fire-box, and also the several flues connected with said drum, is a cylindrical shield 21 resting on the bottom 2 of the exterior casing and having its top tapered inwardly.

Extending laterally from the lower portion of the drum 11 somewhat above the perforations 10 are air-ducts 23 leading into upwardly-extending branches 24 opening close to the top of the exterior casing 1. These lateral branches 23 may serve as supports for the shield 21 instead of the latter extending to the bottom 2. In either case, there should be ample openings provided at the lower end of this shield.

A floor heater constructed as heretofore described may, of course, be provided with a

suitable grating for covering the heater so that people walking on the floor are in no danger of stepping into the heater. Such grating, however, is not shown in the drawings.

Now, let it be assumed that it is desirable to use the heater. After the protecting grating has been lifted, then the tube 13 may be removed and fluid issuing from the burner 10 may be lighted. The tapered tube 13 is then reinserted and the device operates to heat the air in the room. The gas entering through the tube 3 is divided by the gauze 7 and diverted by the spreader 8. Air enters 15 through the flues 23 and 24 and reaches the outer wall of the sleeve 9 near the upper end thereof. This air flows down the walls of the sleeve 9 until it reaches the perforations 10 when it enters therethrough and rises in 20 the interior of the drum 11 and serves to supply the gas issuing from the burner 4 with oxygen. Air also enters through the bottoms of the ducts 17 and enters the top of the fire drum 11 through the openings 16, 25 thus together with the air ducts 23 serving to supply all the air necessary to the flame for the combustion thereof. The products of combustion escape through the duct 19 and escape flue 20.

No attempt has been made in the drawings to show the proper proportions of the parts, but it will be understood that in practice the several flues are properly proportioned for the operation just described. Cold air will enter the casing 1 exterior to 35 the shield 21 and passing under the bottom thereof will flow up past the fire box and be there heated and will finally leave through the top 22. By this means the cold air of a 40 room is drawn into the heater and is directed therefrom in a heated condition, while the products of combustion do not reach the room but pass out through a suitable escape flue.

The perforated sleeve 9, acting in the nature of a deflector for the incoming air supplied directly to the burner, prevents any sudden rushes of air into the fire chamber due to the sudden closure or opening of doors 50 in the building, and therefore protects the flame from such sudden rushes of air and so prevents it from being blown out thereby.

The ducts 17 constitute an important part of my invention since without them dead air 55 would gather in the top of the fire chamber and cause explosions which would be liable to injure the device. The floor heater constructed as described is shown in Fig. 4 in elevation inserted between the ceiling of a 60 room and the flooring of the room immediately above, the flooring being cut through for the insertion of the heater, and the usual grating being shown in place.

I claim:—

1. A heater having a completely closed 65 bottom and an open top, a burner located at the bottom of the heater, ducts for the air to be heated having both inlet and outlet at the top of the heater and air-supply ducts for the burner coming from the top of the heater 70 and leading to the burner.

2. A heater comprising a suitable casing open at the top and completely closed at the bottom, a burner located at the bottom of the heater, a fire chamber in which the 75 burner is located, air-ducts leading from the top of the heater to the burner, and other air-ducts leading from the bottom of the heater into the top of the fire chamber.

3. A heater comprising a body portion 80 open at the top and closed at the bottom, a burner located at the bottom of the body portion, a fire chamber surrounding said burner, air-ducts leading to the burner from the top of the chamber, and a perforated air- 85 deflector interposed between the air-ducts and burner.

4. A heater comprising a body portion open at the top and closed at the bottom, a burner located at the bottom of the body 90 portion, a fire chamber surrounding the burner, a tapering sleeve at the bottom of the fire chamber around the burner and provided with perforations, and air-ducts leading from the top of the heater and entering 95 the fire chamber exterior to the deflector and above the perforations therein.

5. A heater comprising a body portion open at the top and closed at the bottom, a burner located at the bottom of the body 100 portion, a fire chamber surrounding the burner and closed at the top, and a removable fire-spreader inserted in the top of the fire chamber.

6. A heater comprising a body portion 105 open at the top and closed at the bottom, a burner located at the bottom of the body portion, a fire chamber surrounding the burner and closed at the top, a removable flame-spreader inserted in the top of the 110 fire chamber, air-flues leading from the lower portion of the body of the heater into the upper portion of the fire chamber, an escape flue for the burned gases leading from the fire chamber, a perforated air-deflector surrounding 115 the burner, and air-ducts leading from the upper portion of the body of the heater to the exterior of the deflector around the burner.

In testimony that I claim the foregoing as 120 my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM H. BURK.

Witnesses:

A. J. STACKHOUSE,
J. WM. RHOADES.