No. 869,964.

PATENTED NOV. 5, 1907.

J. EDWARDS & W. V. SHEPPARD.

BURNER FOR HOT AIR FURNACES.

APPLICATION FILED MAR. 24, 1906.

2 SHEETS—SHEET 1.

FIG. 1

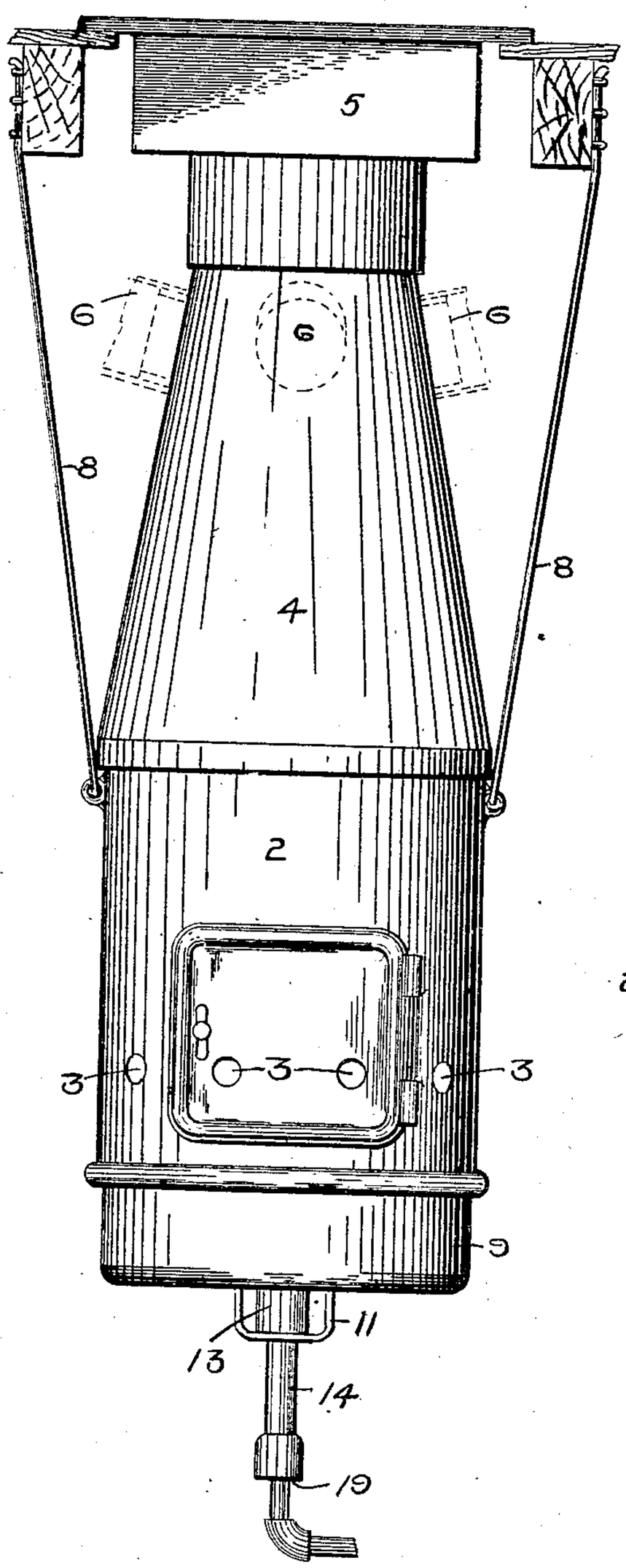
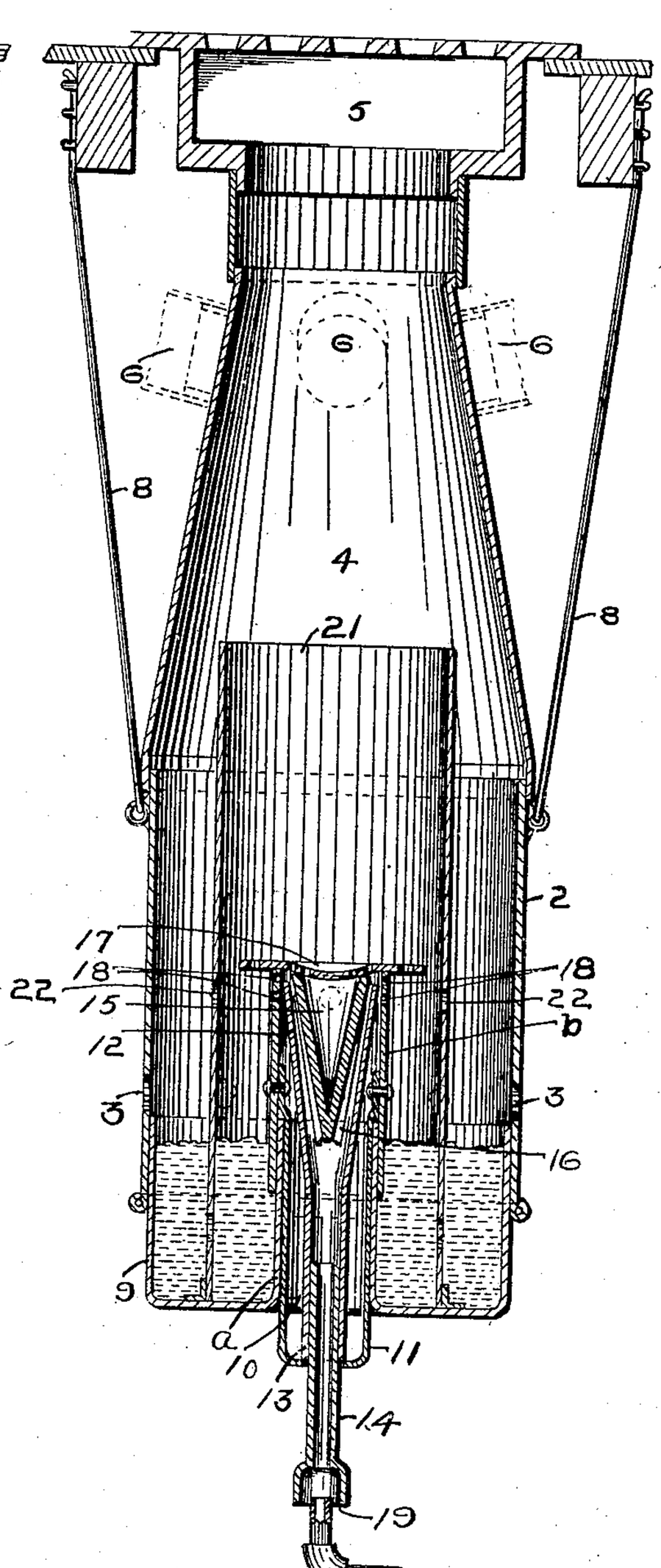


FIG. 2



WITNESSES.

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2 SHEETS—SHEET 2.

FIG. 5

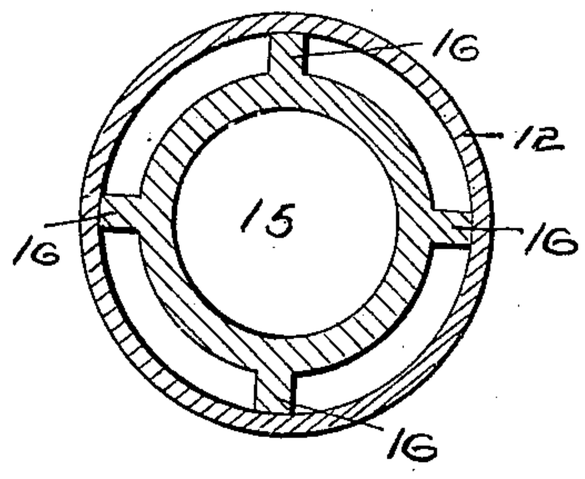


FIG. 4

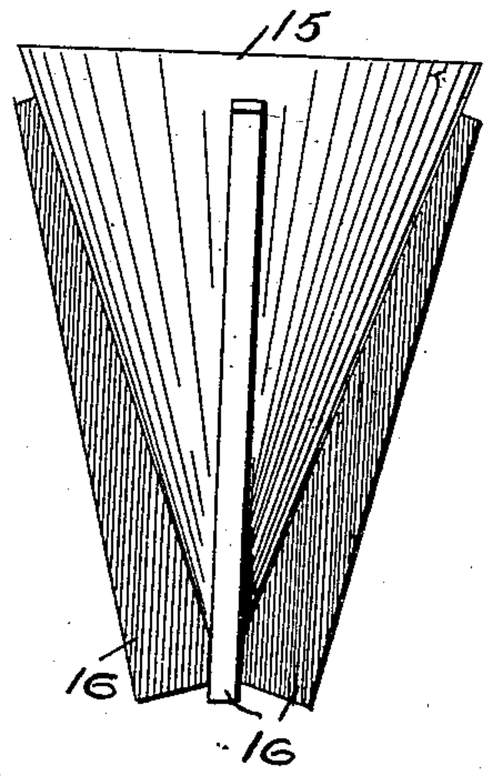


FIG. 3

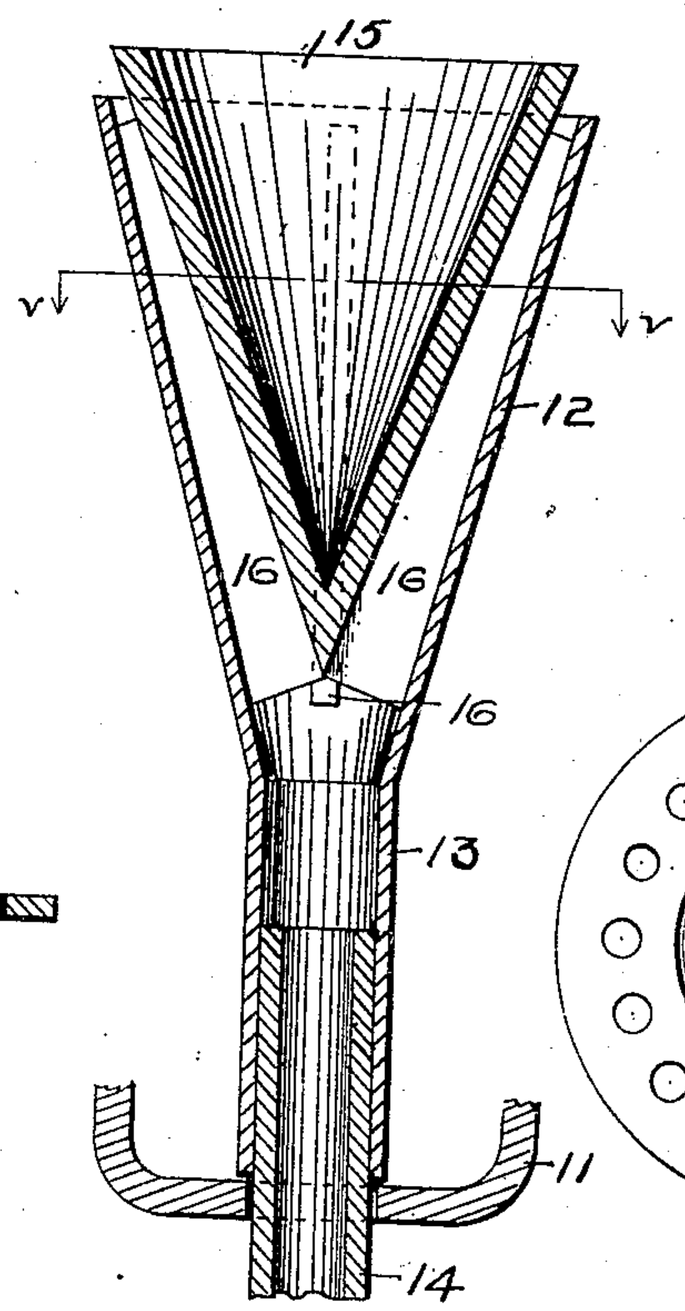


FIG. 7

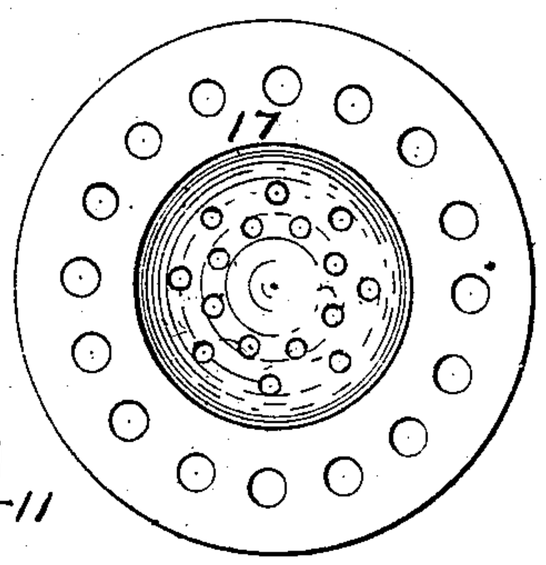


FIG. 6



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UNITED STATES PATENT OFFICE.

JOHN EDWARDS AND WILLIAM V. SHEPPARD, OF ALLEGHENY, PENNSYLVANIA.

BURNER FOR HOT-AIR FURNACES.

No. 869,964. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed March 24, 1906. Serial No. 307,765.

To all whom it may concern:

Be it known that we, JOHN EDWARDS and WILLIAM V. SHEPPARD, both of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Gas-Burners for Hot-Air Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a furnace and burner illustrating our invention; Fig. 2 is a vertical sectional view of the same; Fig. 3 is a detached vertical sectional view of a portion of the burner; Fig. 4 is a side elevation of a portion of the same; Fig. 5 is a cross section on the line V—V of Fig. 3; Fig. 6 is a detached vertical sectional view of the deflector and Fig. 7 is a plan view of the same.

Like symbols of reference indicate like parts wherever they occur.

Our invention relates to hot air furnaces for heating dwelling houses and other buildings; and it consists in a burner and combustion chamber and a surrounding hot air chamber, the parts being so formed and combined as to give the greatest attainable amount of heat from the combustion of a small amount of fuel.

We will now describe our invention so that others skilled in the art may manufacture and use the same.

In the drawing 2 represents the hot air chamber, which may be formed of sheet metal or other suitable material, having air openings 3 near the base of the chamber and a hot air conduit 4 at the upper end of the chamber, which conduit leads to a register 5 which opens into the room to be heated. Opening from the conduit 4 there may be one or more branch conduits 6 which lead to registers in other apartments. This hot air chamber may be supported from the ceiling of the cellar below the apartments to be heated by hangers 8, or it may be supported by any other suitable means. In the lower portion of the chamber 2 is a water tank 9. Extending upwardly from the center of the water tank 9 and opening through the bottom of the same is the burner chamber 10. This burner chamber is formed of two cylinders, *a*, *b*, one telescoping in the other, the lower cylinder *a* extending upwardly above the level of the water in the tank 9, while the upper cylinder *b* has a yoke 11 extending downwardly and out of the chamber 10 through the lower cylinder *a*. Within the burner chamber 10 is the gas burner which is composed of the outer funnel 12 having at its lower end a sleeve 13 which fits over the end of the gas pipe 14, and rests on or is secured to the lower end of the yoke 11. Fitting within the funnel 12 is an inverted cone 15 which is separated from the sides of the funnel by the vertical wings 16. On top of the cone 15 is a disk-shaped deflector 17. In the cylinder *b* below the deflector 17 are gas jets or apertures 18. At the lower end of the gas pipe 14 is the mixer 19 which causes air to mix with the gas as it passes to the burner. All parts of the burner may be formed of iron or other metal excepting the deflector 17 which is preferably formed of a refractory material such as lava or volcanic scoria. By means of the yoke 11 the burner and the cylinder *a* may be raised or lowered, thus changing the dimensions of the burner chamber to regulate the mixture of gas and air therein. Outside of the burner chamber 10 is the combustion chamber in which the mixture of gas and air from the burner is consumed. This combustion chamber acts as a draft pipe and it is formed by the cylinder 21 extending upwardly from the bottom of the tank 9 in the hot air chamber 2 around the burner cylinders *a* and *b* and at a distance about midway between the burner cylinders and the hot air chamber cylinder. In the cylinder 21 are apertures 22 which permit air to pass from the hot air chamber to the combustion chamber for the purpose of aiding in supporting combustion.

The operation of our furnace will be readily understood. The gas and air which are mingled in the pipe 14 by the mixer 19 pass to the burner apertures 18 and burn outside of the same in the combustion chamber; thus heating the deflector and the cone 15 and causing perfect combustion of the gas in the cylinder 21. The gas and air, as they pass to the burner apertures, come in contact with the heated cone 15 and deflector 17 and under the influence of the draft pipe 21, this combustion produces a most intense heat within the cylinder 21, which not only heats the air passing upward to the register in the hot air chamber 2, but mingles therewith and passes to the register 5. The water in the tank 9 adds moisture to the heated air.

Although we have shown and described but a single burner, the hot air chamber 2 may be made of sufficient area to contain a number of similar burners, whereby the amount of air-heating capacity may be increased in order to supply heat to a larger building or to a greater number of rooms.

Our furnace is compact, it insures almost perfect combustion of the gas, and gives the greatest possible amount of heat.

Having thus described our invention, what we claim and desire to secure by Letters Patent is

1. In a hot air furnace, the combination of a burner consisting of a burner chamber for feeding air to the burner, a funnel and a cone located in said chamber and a gas conduit leading to the neck of the funnel; substantially as specified.

2. In a hot air furnace, the combination of a burner chamber consisting of telescoping parts, means for adjusting the parts, a burner consisting of a funnel, cone, and deflector, said funnel and cone located within the burner chamber, and a hot air chamber surrounding said burner chamber; substantially as specified.

3. In a hot air furnace, the combination of a burner chamber consisting of telescoping parts, a burner consisting of a funnel and a cone, said burner chamber feeding

air to the burner, and means for adjusting the burner in the burner chamber; substantially as specified.

4. In a hot air furnace, a burner consisting of a funnel having a neck telescoping on the end of a gas conduit, an inverted cone situate within the funnel, a deflector, a burner chamber consisting of telescoping parts surrounding the burner, and means for adjusting the telescoping parts of the burner chamber; substantially as specified.

5. In a hot air furnace, the combination of a burner chamber consisting of telescoping parts, a burner within said chamber comprising a funnel and an inverted cone situate within the funnel, a deflector supported upon said cone and projecting beyond said chamber, and burner apertures in said burner chamber adjacent to the top of said funnel.

In testimony whereof, we have hereunto set our hands.

JOHN EDWARDS.
WILLIAM V. SHEPPARD.

Witnesses:
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