No. 815,099. PATENTED MAR. 13, 1906.

L. F. KNODERER.

GAS HEATER.

APPLICATION FILED AUG. 28, 1905.

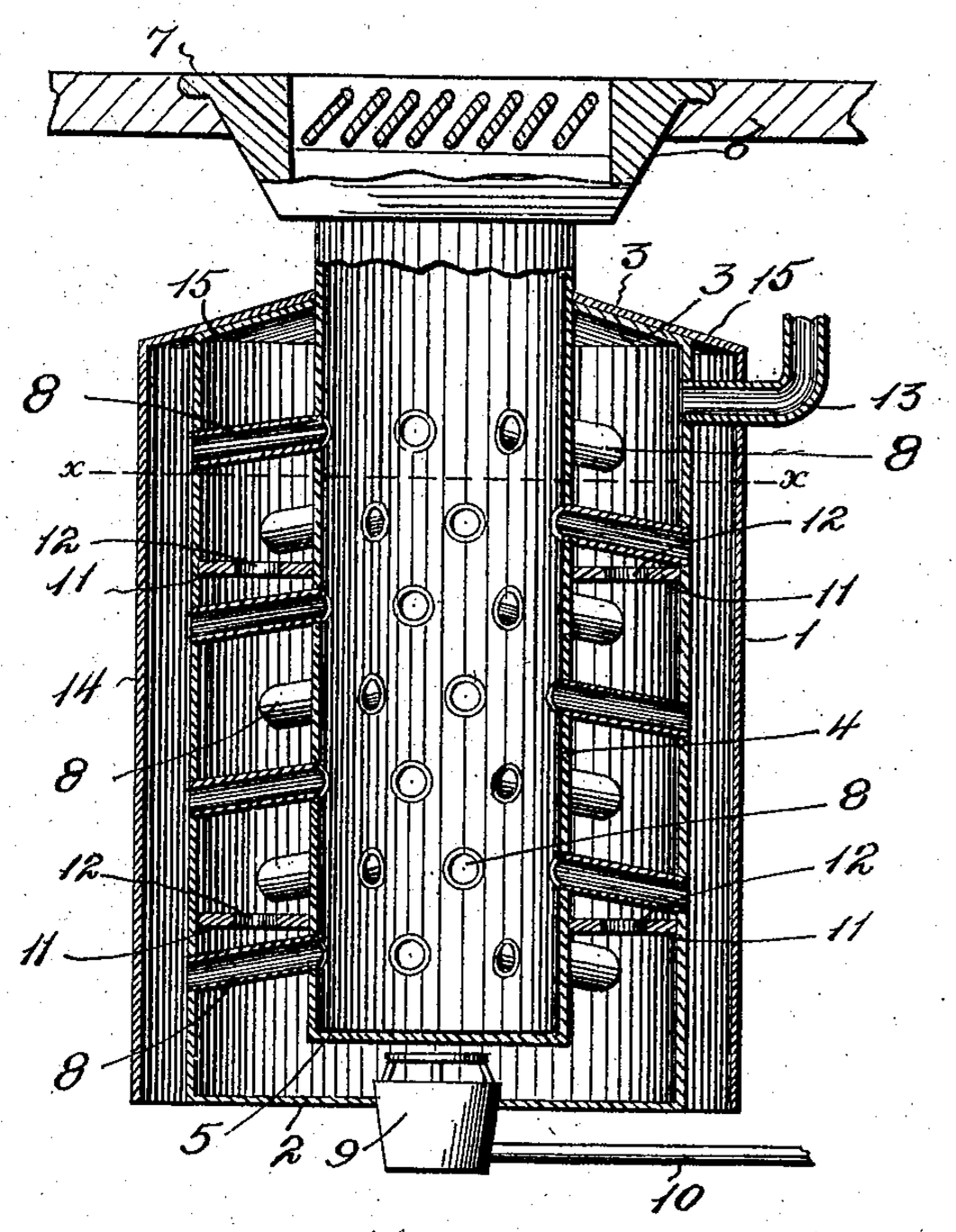

Fig. 1.

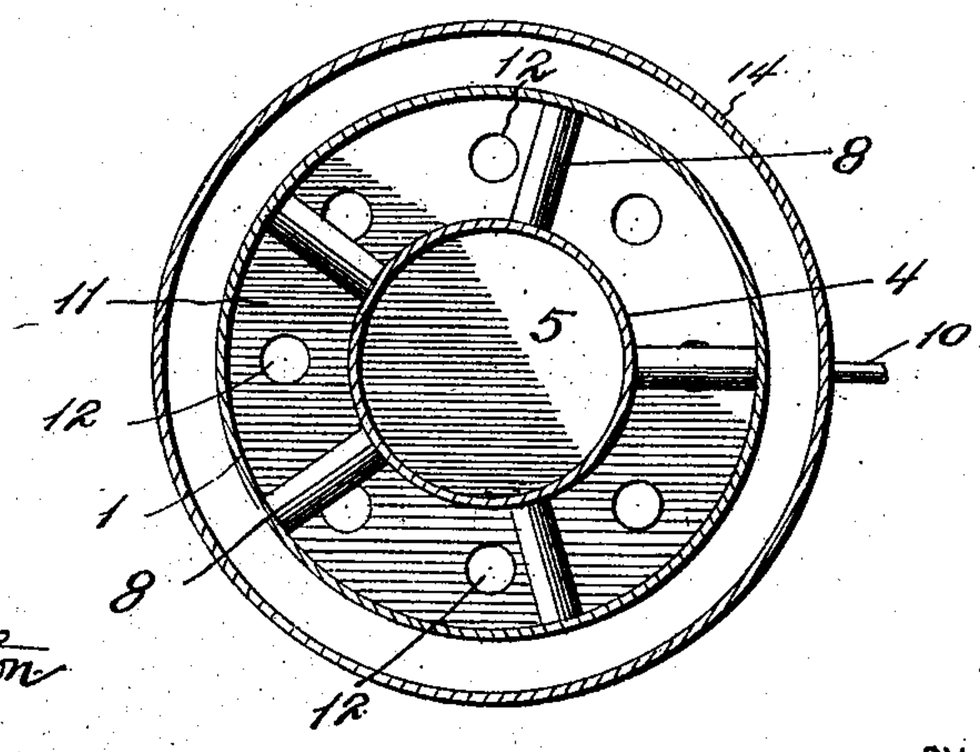

Fig. 2.

WITNESSES:

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LEVI F. KNODERER, OF COLUMBUS, OHIO.

GAS-HEATER.

No. 815,099. Specification of Letters Patent. Patented March 13, 1906.

Application filed August 28, 1905. Serial No. 276,007.

To all whom it may concern:

Be it known that I, LEVI F. KNODERER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Gas-Heaters, of which the following is a specification.

My invention relates to new and useful improvements in gas-heaters.

The object of the invention is to provide a gas-heater comprising a drum provided with a central hot-air chamber having inclined inlet-tubes extending through the drum and an outer shell or casing providing a cold-air-inlet space about the drum acting to collect the cold or fresh air and direct the same to the tubes.

It is further the object to combine with this drum a gas-burner having its flame impinging directly against the bottom of the hot-air chamber and to provide retarding and radiating parts whereby the products of combustion are fully deprived of their heat and the heated air delivered to a floor-register or the like.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, efficient, and simple and inexpensive to manufacture.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of the heater, the register, and register-box, a portion of the central hot-air chamber and the register-box being shown in elevation. Fig. 2 is a horizontal cross-sectional view taken on the line *x x* of Fig. 1.

In the drawings the numeral 1 designates the casing or shell of the drum, which is cylindrical in form and provided with a closed bottom 2 and conical top 3. Within the casing of the drum a cylindrical hot-air chamber 4 is arranged centrally and provided with a closed bottom 5, which terminates a slight distance above the bottom 2 of the casing 1. The hot-air chamber 4 is extended through and above the top 3 of the drum-casing and terminates in an upwardly-flaring register-box 6, which is adapted to receive an ordinary floor-register 7. The register is adapted to be supported in the upper surface of the floor in the usual manner and the other parts of the heater suitably supported beneath the floor.

A plurality of short inclined tubes 8 extend between the drum-casing 1 and the hot-air chamber 4. These tubes are arranged in staggered relation and are adapted to convey the fresh air from the outside of the drum across the annular space provided between the casing and the hot-air chamber and deliver the air into the hot-air chamber, from which it will rise into the register-box and be distributed to the register. In the bottom 2 of the drum I arrange a suitable gas-burner 9, which projects into the drum some distance and terminates in close proximity to the bottom 5 of the hot-air chamber. A pipe 10 is connected to the burner to supply gas thereto in the usual manner. The flame produced by the burner will impinge on the bottom 5 of the hot-air chamber, and the products of combustion generated pass up and around the sides of the chamber and also about the inclined tubes 8, thus heating the same, so that the air in passing through the tubes and up the hot-air chamber will be thoroughly heated without coming in contact with the products of combustion or the fumes. Between the hot-air chamber and the drum-casing 1 I provide at the upper and lower portions of the space thus formed circular baffle-plates 11, each of which is provided with a plurality of openings 12. These plates serve to retard the passage of the products of combustion and divide the interior of the drum into chambers through which the products are caused to pass before escaping, thus being fully deprived of their heat. Near the upper end of the drum an outlet-pipe 13 is provided, so that the waste products and fumes may be carried off.

I have found that the best results are had by providing an outer shell or jacket 14, having a conical top 15, and placing the same over the drum, so that the top rests on the top 3 thereof. The shell or jacket is somewhat larger than the drum, so as to provide an annular space therebetween up which the cold or fresh air passes. This shell or jacket serves to collect the fresh air and direct the same to the inclined tubes 8, so that a constant circulation is kept up and the air passing through the heater prevented from becoming foul or unhealthy. It will be apparent that the heated air passing out of the heater 7 will to some extent create a suction or vacuum which will draw in the fresh air, thus

keeping up a constant circulation, which circulation is enhanced by the outer shell, which collects and directs the fresh air to the tubes. In this manner overheating of the parts is also obviated.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination with a floor-register, of a hot-air chamber having communication with the register, a casing surrounding the hot-air chamber so as to provide a space therebetween, inclined inlet-tubes extending from the casing to the chamber, a shell surrounding the casing closed at its upper end and providing a space between itself and the casing, a gas-burner arranged in the lower portion of the casing directly beneath the hot-air chamber, and means for conducting the products of combustion from the casing.

2. In a gas-heater, the combination with a floor-register, of a hot-air chamber, a radiating-box carried by the chamber having communication with the register, a casing closed at its top and bottom surrounding the hot-air chamber so as to provide a space therebetween, inclined inlet-tubes extending between the hot-air chamber and the casing across the space therebetween, a shell larger than the casing surrounding the same and having an open lower end and a closed top, a gas-burner arranged in the casing beneath the hot-air chamber, retarding means arranged in the space between the hot-air chamber and the casing, and means for conducting the products of combustion from the casing.

In testimony whereof I affix my signature in presence of two witnesses.

LEVI F. KNODERER.

Witnesses:
A. L. PHELPS,
M. B. SCHLEY.