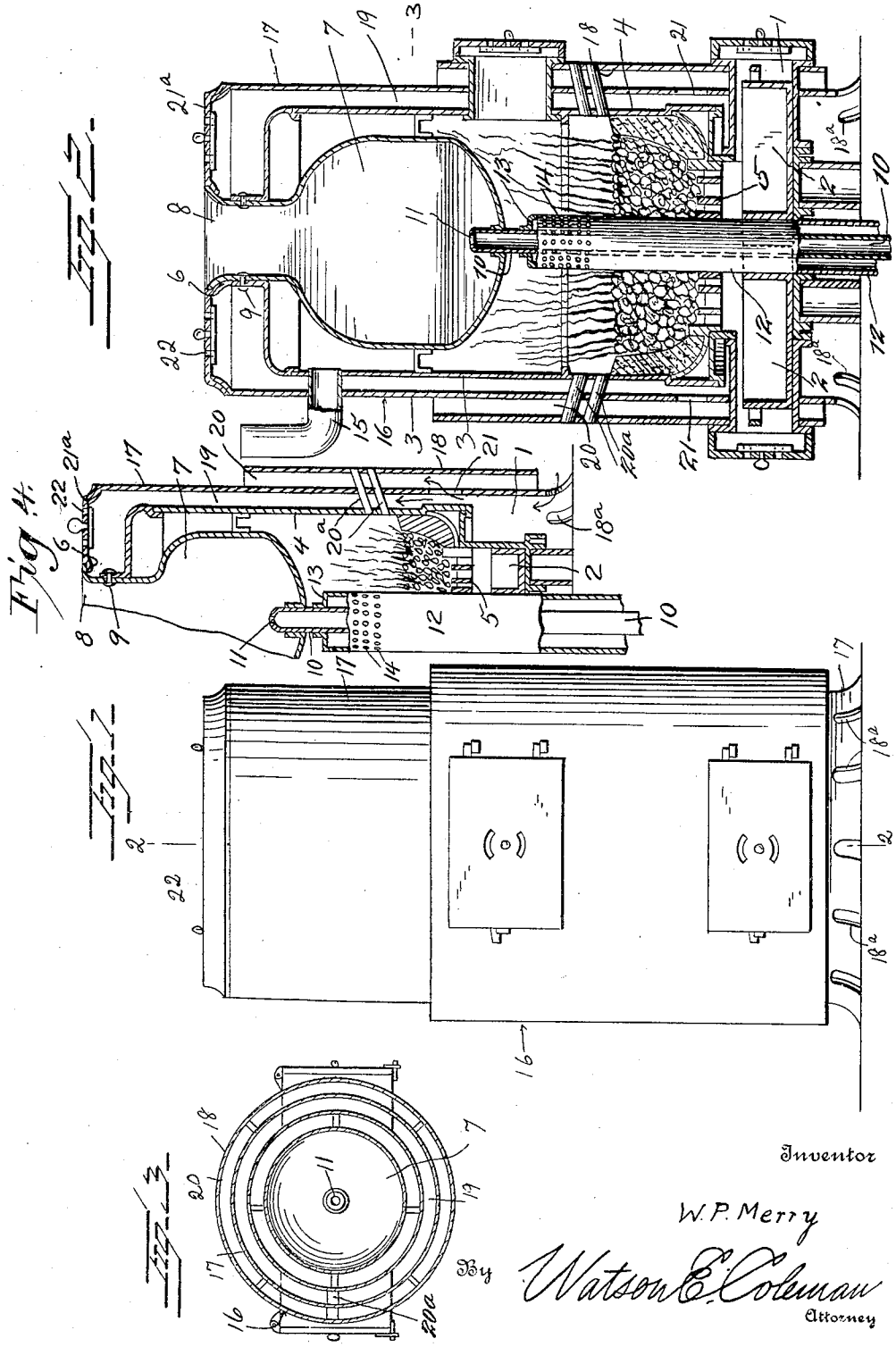
W. P. MERRY.

HEATER.

APPLICATION FILED MAR. 15, 1919.

1,328,246.

Patented Jan. 13, 1920.



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HEATER.

1,328,246. Specification of Letters Patent. Patented Jan. 13, 1920.

Application filed March 15, 1919. Serial No. 282,806.

To all whom it may concern:

Be it known that I, WHITING P. MERRY, a citizen of the United States, residing at Sharpsville, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Heaters, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved heater, particularly to a furnace or stove type, and an object of the invention is to provide a device of this kind, which is simple and practical in construction, and which may be manufactured for a small cost and sold at a reasonable profit.

A further object of the invention is to provide a heater provided with a fire box, a hot air drum super-imposed with relation to the box and a cold air flue with its perforated end terminating in the hot air drum, whereby the air from the flue, as it enters the drum through the perforated end of the flue becomes highly heated, thereby providing pure heat which escapes from the drum into the room, in which the heater is located. If desired, various flues may be connected to the drum, for carrying the heat to localities remote from the heater.

The invention further aims to provide a double wall casing in surrounding spaced relation from the wall of the fire box, thereby providing an air space, the cool air which passes therethrough becoming also heated. This heated air also escapes into the room, since the upper end of the double wall casing opens into the room.

It is obvious that since the outer casing consists of double spaced walls, an additional cold air space is afforded.

A further object of the invention is the provision of a cold air draft flue passing up through the fire box and having its upper closed end perforated about the fuel which may be either coal or wood, thereby providing a draft in the box.

The design of the structure as now illustrated is deemed preferable. However, in reducing the structure of the device to a more practical form for commercial purposes, alterations in the details of construction may be found necessary. The right to these alterations is claimed, provided the alterations fall within the scope of what is claimed.

The invention comprises further features and combination of parts, as hereinafter set forth, shown in the drawings and claimed.

In the drawings:

Figure 1 is a view in side elevation of the improved heater constructed in accordance with the invention.

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1, thereby illustrating the various features of construction, namely the various flues and air spaces.

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view through one-half of the heater at right angles to that shown in Fig. 2, thereby showing the cold air spaces 19 and 20, and also showing the openings 18^a, which allow air to enter the space 19.

Referring to the drawings, 1 designates an ash pit, which receives the slides or drawers 2, for the reception of the ashes.

Arranged above the ash pit is an inner casing 3, the lower portion of which constitutes a fire box 4, provided with the usual grate bars 5. This inner casing is provided with a restricted upper end portion 6.

Arranged in the casing 3 is a hot air drum or dome 7, the upper end of which also terminates in a restricted portion 8, the wall of which is connected to the restricted upper end portion 6 of the casing 3, as shown at 9. Obviously the restricted upper end 8 extends into the restricted upper end 6. A cold air flue 10 enters the bottom of the hot air drum or dome, and its end portion 11 is open immediately above the inner surface of the bottom of said dome. The other end of the air flue 10 is open and receives a supply of cold air from any suitable source the air adapted to pass through the flue 10 and subsequently enter the drum or dome. The dome or drum becomes heated to a very high degree, and the inrush of the cold air through the flue 10, will consequently become heated to a very high degree. This heated air may escape into the room, in which the heater is located. However, the upper end of the drum or dome may have connected thereto several flues, for conducting the heated air to other localities, if desired. Another cold air flue or pipe 12 enters the fire box, and its upper end portion 13 is closed, and terminates a short distance above the bed of the fire. The cylindrical wall of the cold air flue or pipe 12 immediately below its closed end 13, that is

between its closed end 13 and the upper surface of the fire bed is supplied with a plurality of perforations 14, thereby permitting of the escape of the cool air into the fire box, thereby affording a better combustion, and insuring a draft. Obviously the mixing of the cold air from the flue 12 with the heat arising from the fire in the fire box affords a combustion of such a nature as to consume the most of the smoke, thus producing additional heat, which radiates through the drum or dome. A smoke flue 15 is connected to the upper part of the casing 3, and to which any suitable carrying-off flue (not shown) may be connected for conducting the smoke to the exterior atmosphere, exteriorly of the room in which the heater is located.

Arranged in surrounding spaced relation to the casing 3 is an outer casing 16, which comprises the walls 17 and 18. By spacing the outer casing 16 from the casing 3, a hot air space 19 is afforded. Owing to the casing 16 consisting of the walls 17 and 18, which are spaced, an extra air space 20 is provided. The outer wall 18 of the casing 16 extends upwardly and substantially a trifle more than half the height of the heater, and cold air is allowed to enter this space 20 at the lower part of the heater, some of which may pass through the openings 21 into the space 19, while the greater portion of such air mixes with the air that may pass from the space 19 through the openings 21, and this mixture is allowed to escape at the top of the outer wall 18, which, as previously stated, terminates considerably below the top of the heater. The space 20 between the walls 17 and 18 constitutes a cold air draft space, acting to reduce the intensity of the heat about that portion of the wall of the heater near the fire pot.

Cold air also enters the space 19 at the lower part of the heater, through the openings 18^a, which are formed at the base or lower portion of the inner wall 17 of the casing 16. This cold air passing between the wall of the fire pot casing and the wall 17, also acts to reduce the intensity of the heat emanating immediately from the fire pot casing. The cold air which enters the space 19 either enters the space 20, through the openings 21, or ascends into the upper part of the space 19, where it may be allowed to escape into the room, by opening the damper controlled openings 22. By closing the damper controlled openings 22, the cold air which enters the space 19 through the openings 18^a will be so controlled as to cause some of the air to pass through the openings 21, into the space 20. In fact, the cold air entering the space 19 may be regulated. It is true, however, that the air that passes through the openings 21 into the space 20 also passes into the room, but it is not so intensely heated as it is when it is allowed to ascend into the upper part of the space 19, and allowed to pass into the room, by opening the damper controlled openings 22, since it is more intensely heated in passing along the wall of the fire pot casing.

It is to be noted that short flues or pipes 20^a are arranged in the several walls of the heater, that is at a point just a little above the fire pot, so that a minimum amount of heat may pass therethrough to the exterior of the heater. The outer ends of these short flues or pipes may be controlled by dampers, not shown. The air that passes through the openings 18^a passes upwardly through the fire box, upon opposite sides of the ash pit, which receives the slides or drawers 2. In other words, the ash pit is not constructed to conform to the full diameter of the heater, that is at right angles to the arrangement of the ash pit, so that the air may pass upwardly upon either side, as will be thoroughly understood from Fig. 3.

The invention having been set forth, what is claimed as new and useful is:

1. In a heater, the combination with an inner casing provided with a fire box and an ash pit below, of a hot air chamber in the upper part of the casing and spaced from its wall, means passing centrally upwardly through the heater for conducting cold air into said chamber to be heated, a double wall outer casing in surrounding relation to the inner casing, an air space between the inner wall and the inner casing, and a smoke flue connected to the upper part of the inner casing, an annular air space between the double wall outer casing and the inner casing and in communication with the first air space, the upper end of the inner wall of the outer casing having damper controlled openings, for the passage of the air, which becomes heated in the first air space, into the room.

2. In a heater, the combination with an inner casing, provided with a fire box and an ash pit therebelow, of a hot air chamber in concentric spaced relation to the upper portion of the inner casing, means for conducting air into said chamber, a cold air draft flue extending into the fire box provided with a closed end terminating immediately above the bed of the fire and provided with perforations, an outer double wall casing, in surrounding spaced relation to the inner casing, and a smoke flue connected to the upper end of the inner casing.

3. In a heater, the combination with an inner casing provided with a fire box and an ash pit therebelow, of a hot air drum provided with a chamber in concentric spaced relation to the inner casing, a cold air flue extending through the bottom of the drum and having the perforated end within the

interior of the chamber, a cold air draft flue extending into the fire box and having a perforated closed end immediately above the bed of the fire, an outer double wall casing in surrounding spaced relation to the inner casing, an air space between the inner wall of the outer casing and the inner casing, an air space between the inner and outer walls of the outer casing, in communication with the air space between the inner wall of the outer casing and the inner casing, the upper end of the inner wall of the outer casing having openings, dampers therefor for controlling the escape of heated air from the first air space, the air space between the inner and outer walls of the outer casing opening to the interior of the room.

4. In a heater, the combination with an inner casing provided with a fire box, of a hot air drum in super-imposed relation to the fire box, of a pair of flues passing centrally upwardly through the fire box, one arranged within the other and terminating in a perforated end into the hot air drum, the other terminating in a perforated portion above the fire box, adapted for conveying cold air to the space surrounding the drum.

5. In a heater, the combination with an inner casing provided with a fire box and an ash pit below, of a hot air drum in the casing and spaced from its wall and being in super-imposed relation to the fire box, means passing centrally upwardly through the heater and through the fire box communicatively connecting with the interior of the drum and the space surrounding the exterior of the drum, for conducting cold air in said respective portions of the heater, the upper end of the hot air drum terminating in an exit opening, a double wall outer casing in surrounding spaced relation to the inner casing, a cold air space between the double wall outer casing and the inner casing, one of the walls of the outer casing having openings of communication with the air space between the double wall casing and the inner casing, a cold air space between the double walls of the outer casing and being open at the top and the bottom and having openings of communication with the first cold air space.

6. In a heater, the combination with an inner casing provided with a fire box and an ash pit below, of a hot air drum spaced within the casing and being arranged above the fire box, a pair of cold air flues passing centrally upwardly through the heater, one communicatively connecting with the interior of the drum, the other communicatively connecting with the space surrounding the drum, the upper end of the drum terminating in an exit opening, an outer casing surrounding the inner casing and comprising inner and outer walls, a cold air space between the inner wall of the outer casing and the inner casing, a cold air space between the inner and outer walls of the outer casing, and being open at the top and the bottom, the lower portion of the inner wall of the outer casing having openings of communication with the first cold air space, said inner wall of the outer casing having additional openings of communication between the two cold air spaces, and damper controlled openings in the top of the inner wall of the outer casing, for controlling the air in the first cold air space.

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

WHITING P. MERRY.

Witnesses:
HARVEY V. BYERLY,
MORRIS BLOCH.