

(No Model.)

J. W. CLARK.
HEATING FURNACE.

No. 379,364.

Patented Mar. 13, 1888.

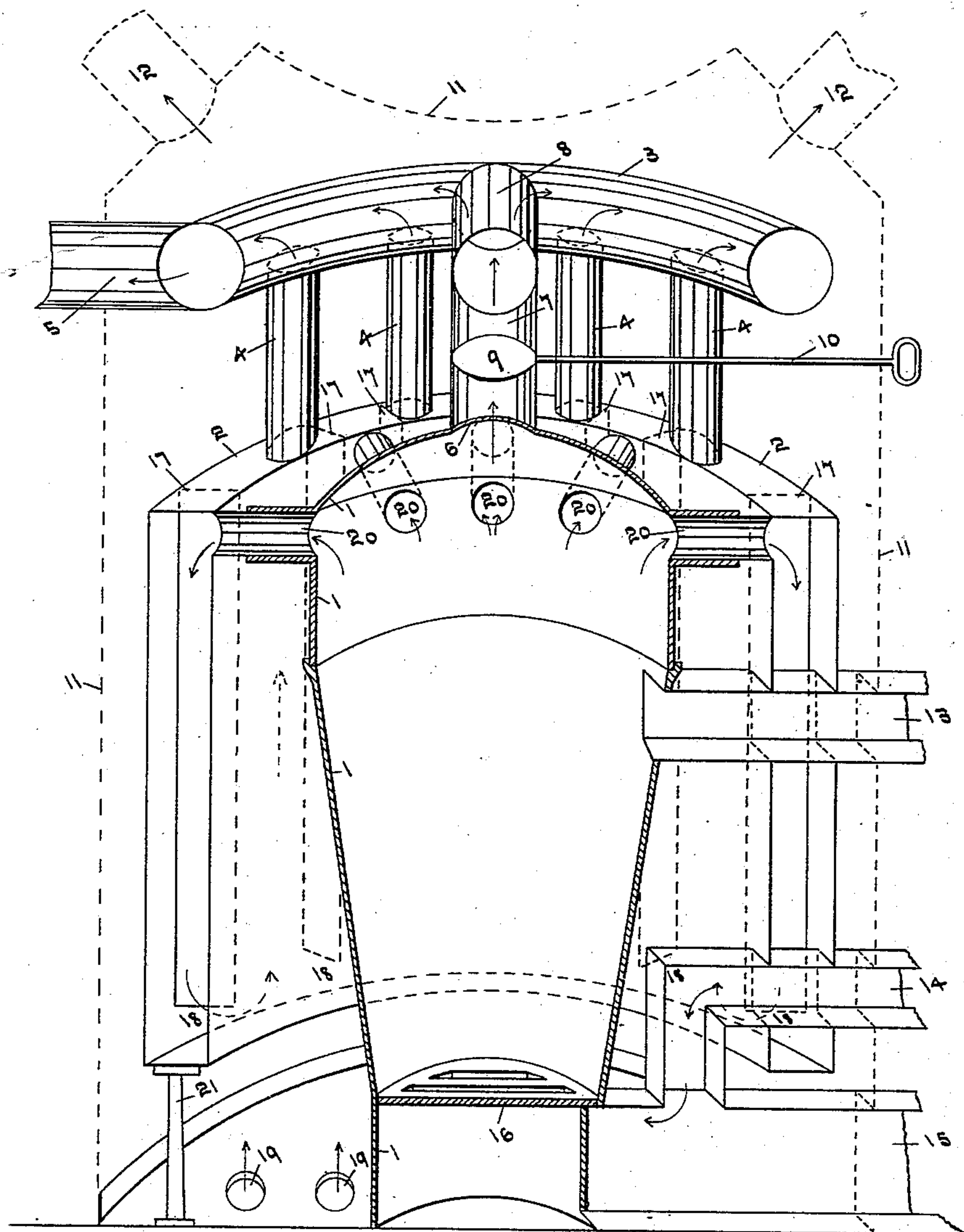


Fig 1

Witnesses:

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HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 379,364, dated March 13, 1888.

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To all whom it may concern:

Be it known that I, JOHN W. CLARK, of the city of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Heating-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms part of this specification.

My invention relates to an improvement in heating or hot-air furnaces; and it consists, principally, in surrounding the fire-pot and combustion-dome of the furnace with an encircling radiator of peculiar construction, as will be hereinafter described and set forth.

Referring to the drawing, the figure represents in perspective a vertical section of my improved furnace, in which—

1 represents the walls of the ordinary ash-pit, fire-box, and combustion-dome.

2 represents the encircling and surrounding radiator.

3 represents an encircling and surrounding smoke-flue, which is of approximately the same diameter as radiator 2. This is located above the radiator and is connected therewith by pipes 4. Located at any convenient point on flue 3 is a smoke exit pipe or collar, 5. The upper portion of combustion-dome 1 is provided with an aperture, 6, to which is connected the vertical pipe 7. This pipe connects with a horizontal cross-pipe, 8, which connects at each end with flue 3. Vertical pipe 7 is provided with an ordinary damper, 9, which is actuated by handle 10. The dotted lines 11 represent the ordinary metallic casing of a furnace, although brick or stone may be used in place of it if desired.

12 represents the ordinary hot-air pipes connected with and leading from casing 11.

13 represents the ordinary feed-opening into the furnace, which can be closed by door or other means.

14 and 15 represent air-passages leading beneath the grate 16, the functions of which will be described later on.

Reference to the drawing will show that

the radiator 2 is provided with a series of vertical diaphragms, 17. These diaphragms are continuous with the walls of the radiator, except at the bottom, where they are shortened sufficiently to leave a passage between their lower ends and the bottom wall of the radiator, as shown at 18. Air-passages 14 and 15 are closed at their outer ends by doors, dampers, or any other known method and are designed to operate as follows: In the normal operative condition of the furnace passage 14 is closed and the supply of air for supporting combustion is admitted through passage 15. At certain times the heat radiated by the furnace may be in excess of the requirements. In such case passage 15 is closed and passage 14 opened. By this means the current of inflowing air absorbs heat from the air in the interior of the furnace-casing, resulting in lowering its temperature and at the same time raising the temperature of the inflowing air-current. This has, in a measure, the effect of a "hot blast" and results in economy in the use of fuel.

The operation of my furnace is as follows: Fire is kindled in the fire-pot and the damper 9 opened, so that the products of combustion pass directly up pipe 7, thence horizontally through pipe 8 and into flue 3, and from thence to the smoke-exit 5. This arrangement forms what I call a "direct-draft" furnace. After the fuel is well ignited, I close damper 9, when the products of combustion are forced to pass through pipes 20, thence into radiator 2 and down on one side of diaphragm 17, and under the lower end of the same and up on the other side, thence to pipes 4 and through them to flue 3, and thence to smoke-exit 5. This I term the "indirect-draft" furnace.

19 represents holes in the base-plate of the furnace for the admission of the air that is subsequently heated and conveyed off through the air-pipe 12.

21 represents a standard that supports the radiator 2. I provide as many of these standards as the weight and size of the radiator may require. Proper cleaning-apertures are provided in the furnace wherever required, and any ordinary grate can be used in connection therewith.

It will be readily perceived that a furnace

of the construction described affords a large amount of radiating-surface and causes the products of combustion to travel a comparatively long distance in contact with the radiating-surface before they are discharged into the chimney. Changes in construction would readily suggest themselves to one skilled in the art to which my invention pertains, which changes could be made without departure from the central feature or spirit of my invention; hence I do not limit or confine myself to the precise specific construction hereinbefore described and set forth.

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

The combination, with a furnace, of a radia-

tor substantially encircling the fire-pot and combustion-dome of the furnace, having diaphragm-plates dividing the radiator into spaces connected at the bottom, a superposed drum, a series of flues connecting the furnace-dome with the alternate spaces of the radiator, and a series of flues connecting the remaining spaces of the radiator with the superposed drum, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

JOHN W. CLARK.

Witnesses:

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