L. VANDEN DRIESSCHE.

HEATING APPARATUS.

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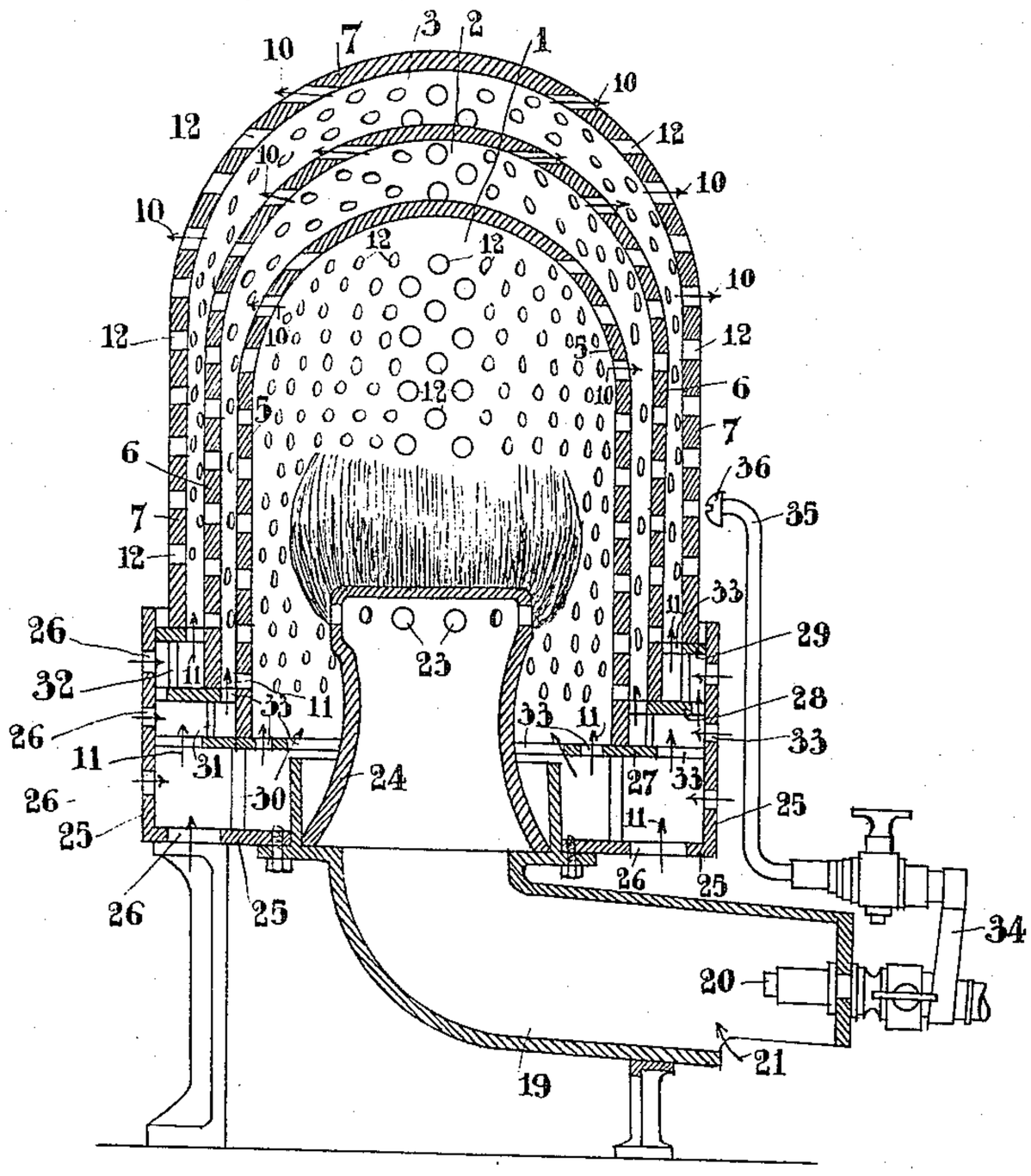
951,060. Patented Mar. 1, 1910.



Witnesses.

Wm. D. Bell.

Elsie Kaufmann.

Inventor.

Louis Vanden Driessche,

by Gartner & Stewart,

Attorneys

UNITED STATES PATENT OFFICE.

LOUIS VANDEN DRIESSCHE, OF BRUSSELS, BELGIUM.

HEATING APPARATUS.

951,060. Specification of Letters Patent. Patented Mar. 1, 1910.

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To all whom it may concern:

Be it known that I, LOUIS VANDEN DRIESSCHE, citizen of the Kingdom of Belgium, residing at Brussels, in Belgium, have invented certain new and useful Improvements in Heating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention constitutes an improvement in combustion devices of all kinds, such as hearths, stoves, burners. Its object is to produce a more complete and otherwise economical combustion.

This invention consists in arranging around the combustion-chamber any desired number (2, 3, 4 or more) of concentric superposed perforated partitions forming casings. Between these partitions are thus formed a series of heating-chambers communicating with each other and with the combustion-chamber proper, by means of the perforations in the partitions. Besides, each of these chambers is in communication with the atmospheric air by means of suitable orifices or flues. Thus the heat-waves coming from the fire-place, are partly barred and retained by the solid parts of the innermost partition, while the other heat-waves escape through the perforations in the first partition and enter in the next chamber, and so on. The combustion effected in the innermost chamber will be but incomplete, while in the other chambers the combustion is gradually completed. The partitions are so thin and placed so close to each other, that they are easily rendered incandescent in all their thickness. They form thus around the fire place a series of small heating-chambers making a whole, in order to store the heat within and around the fire-place and besides to bring the heating-chambers to a high temperature, in such manner that by the admission of fresh air in every chamber a gradual combustion and a formation of new sources of heat is promoted. The intense heating of the whole device is readily effected: the unburned gases and products escaping through the perforations in the innermost partition get mixed up with the fresh air entering in the second chamber, the air having already become strongly heated by the contact with the first wall. In this way, combustible gases escaping unburned from the first combustion-chamber, are burned and a new focus of combustion is thus created. The same operation takes place in the other chamber until the still combustible gases and products are completely burned. The partitions may be made of one or several pieces. The most suitable materials for forming the partitions are refractory substances, clay, metal, and any other suitable substances.

My invention will be found fully illustrated in the accompanying drawing which shows a vertical transversal view of my improved combustion-device applied to a Bunsen-burner, the construction illustrated comprising three concentric superposed bell-shaped partitions forming casings 5, 6, 7 arranged at suitable intervals. The central combustion-chamber is indicated by 1, the supplementary chambers by 2 and 3, and the perforations in the partitions by 12. In each chamber the combustion gases follow the path indicated by the arrows 10, the atmospheric air entering in the chambers as shown by arrows 11. The Bunsen-pipe is marked 19, the air inlet of the Bunsen burner 21, the gas injector 20, the burner 24 and its outlets 23. Any desired gas-igniting device is represented by a branch 34, pipe 35 and burner 36. The manner of admitting the air to each of the combustion-chambers can vary according to the circumstances of each case.

In the figure there is shown a lower construction or base 25, the bottom and walls of which are provided with apertures 26 for admitting air into the chambers 1, 2, 3. On the bottom of the base 25 are arranged, in steps, rings or supports 27, 28, 29, held one above another, at given distances by means of girders 30, 31, 32, so that between the rings and the bottom a series of suitable intervals is created for giving passage to the air which enters through the apertures 26. These rings which carry the bell-shaped partition-walls 5, 6, 7 are provided with perforations 33 through which air (shown by arrows 11) which has entered through the orifices 26, penetrates into the bottom part of each of these chambers 1, 2, 3.

The working of the device is as follows:— By burning the fuel in the central combustion-chamber, a certain quantity of heat is

generated which renders the perforated wall immediately inclosing it incandescent throughout the whole of its thickness. The combustion in this central chamber is, however, incomplete as, owing to the insufficient supply of air for combustion and owing to the insufficient volume of this central chamber compared to the usual quantity of fuel in it, carbon monoxid is generated. The products of combustion in the central combustion-chamber, escape through the perforations of the first wall or partition and meet the current of air entering the second chamber through especially provided air-inlets or flues 26 and 33, which current of air has already become strongly heated by the contact with the first wall. In this way, some of the combustible gases escaping unburned from the first combustion-chamber, are burned which produces a new source of heat and renders the second wall or partition incandescent throughout the whole of its thickness, said second wall radiating its heat not only in the second chamber, but also toward the third and the first or central chamber. The higher the temperature of the inclosing wall, the higher the temperature of the products of combustion of the first chamber, as will be manifest. The same thing happens in the third chamber, in which some of the still unburned gases, escaping from the second combustion-chamber, are also burned by supplying them with another current of heated air, and the heat thus generated renders the third wall incandescent, and so on, so that the fuel is burned by degrees in the chambers succeeding each other, until complete combustion is effected.

It must be pointed out that as the combustion proceeds in the separate combustion-chambers, the combustion gases become poorer and poorer in combustible substances, but nevertheless they continue to burn until the combustion is complete, owing to the high temperature in the chambers and more particularly owing to the energetic mixing of the waste gases with the heated air supply in each chamber.

In order to enable the walls or partitions to be more easily rendered incandescent, it is advisable to make them very thin and to place them near each other.

The partitions may be mounted in any manner, provided that there is admission of air to each of the combustion chambers.

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

In a combustion apparatus, the combination of a series of concentric, superposed, spaced and perforated casings, the inner one forming a central combustion chamber, a support for said casings, said support having air-ducts leading into the spaces between the several casings, a burner, and a base carrying said support and the burner, said base having air-ducts leading to the ducts of the support, substantially as described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

LOUIS VANDEN DRIESSCHE.

Witnesses:

HENRI DE SMET,

CÉLESTIN VERTOMMEN.