

(No Model.)

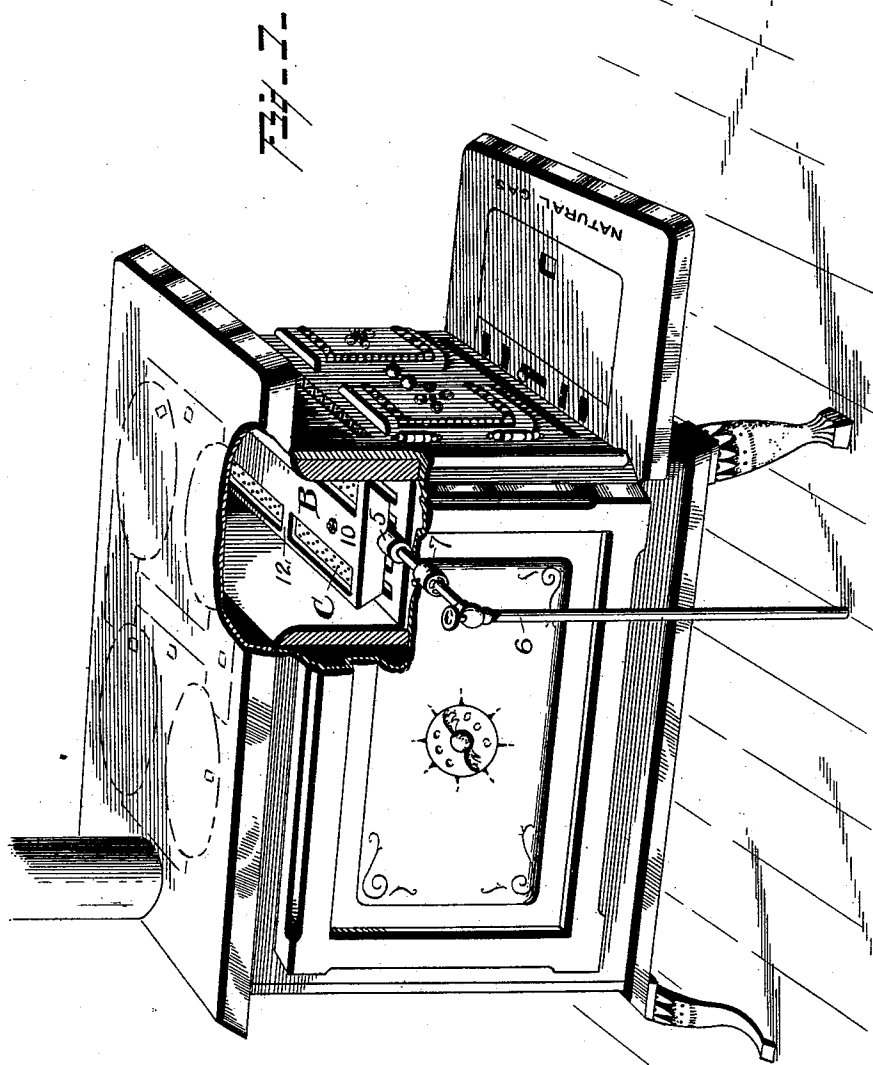
2 Sheets—Sheet 1.

H. E. EARLE.

GAS BURNER FOR STOVES, GRATES, &c.

No. 469,881.

Patented Mar. 1, 1892.



Witnesses

Albert Spiden.
R. H. C. Smith.

Inventor

Henry E. Earle,

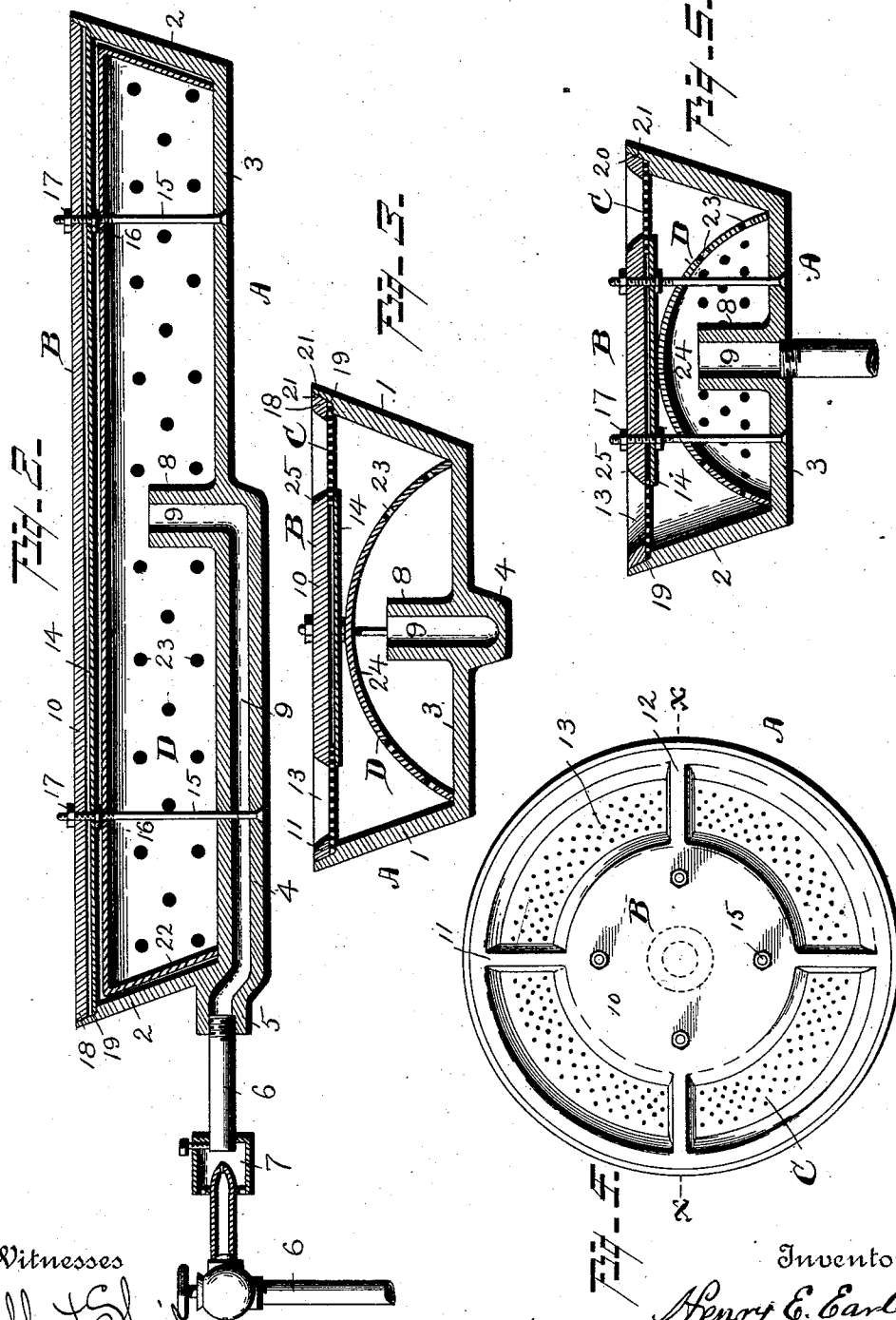
By his Attorney,

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UNITED STATES PATENT OFFICE.

HENRY E. EARLE, OF SIDNEY, OHIO, ASSIGNOR OF ONE-HALF TO JOHN BAKER, OF SAME PLACE.

GAS-BURNER FOR STOVES, GRATES, &c.

SPECIFICATION forming part of Letters Patent No. 469,881, dated March 1, 1892.

Application filed April 28, 1891. Serial No. 390,740. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. EARLE, a citizen of the United States, residing at Sidney, in the county of Shelby and State of Ohio, have invented certain new and useful Improvements in Gas-Burners for Stoves, Grates, &c.; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to gas-burners for stoves, grates, &c., and is particularly adapted for the use of what is generally known as "natural gas."

The main characteristics of my improved burner are that it produces a thorough combustion of the gas; it effectually provides against accidental ignition of the gas within the burner; it provides for ignition of the gas at a point distant from the burner-plate, whereby destruction of the latter by the flame is avoided, and, finally, its construction is such that no part of it except the cap-plate is liable to the destructive action of the flame.

The invention will first be described in connection with the accompanying drawings, and then more particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a cook-stove, a portion of the side and the top being broken away to show the position occupied by my improved burner. Fig. 2 is a longitudinal vertical section through the burner shown in Fig. 1, showing the internal construction of the burner and also the mixer. Fig. 3 is a transverse sectional view of the burner shown in Fig. 1, showing more clearly the relative positions occupied by the deflector, cap-plate, and burner-plates. Fig. 4 is a top plan view of a modified form of burner adapted more particularly for use in heating-stoves. Fig. 5 is a cross-section on the line *xx* of Fig. 4, showing the interior construction of the burner illustrated therein.

Referring to the drawings, A designates the burner-body, which is preferably rectangular

in shape and is formed, by preference, with inclined sides 1 and ends 2. Extending along the bottom 3 of the burner is an integral core 4, the outer end 5 of which projects beyond the end of the burner-body and serves as a coupling, to which is connected the service-pipe 6, carrying a mixer 7. The inner end of the core 5 extends to about the center of the bottom 3 and terminates beneath a boss or nozzle 8, which projects upward within the burner-body, the core and the boss being formed with a bore 9, by means of which the gas from the service-pipe is led to the burner-body.

B designates a cap-plate, which is constructed with a solid central portion 10 and with side pieces 11, which latter are connected to the central portion by means of a series of strengthening-webs 12, Figs. 1 and 4, the spaces between the said webs forming a plurality of rectangular openings 13, through which the gas escapes from the burner-body and at which points it is ignited.

C designates the burner-plates, which are made of a suitable reticulated or foraminous material and serve three very important functions: first, that of preventing the admission of air to the body of the burner while in use; secondly, that of retarding the flow of gas from the burner, and, thirdly, that of dividing the gas into numerous jets. Thus by means of these plates three desirable and necessary ends are attained, namely: the prevention of ignition of the gas within the body of the burner, whereby the formation and accumulation of carbon due to incomplete combustion is effectually prevented; the gas in being retarded in its escape is caused to spread out in an even sheet, so that the jets farthest removed from the point of ingress of the gas burn with the same intensity as those nearest the point of ingress; and the dividing of the gas into numerous jets assures its perfect combustion and also its complete consumption. These plates C are held in position beneath the openings 13 in the cap-plate by means of a plate 14, which latter, together with the burner-body and the cap-plate, are clamped together by means of bolts 15, each carrying two nuts 16 17, the former of which

bear against the under surface of the plate 14 and the latter upon the upper surface of the central portion 10 of the cap. The free ends 18 of the burner-plates fit in recesses 19, 5 formed in the inner surface of the upper edges of the sides 1 and ends 2 of the body, which recesses are each formed with an inclined wall 20, designed to be engaged by the beveled edges 21 of the sides and ends of the cap 10 11, whereby when the nuts 17 are turned the two inclined surfaces 20 21 will be forced together and thus form an air-tight joint. In order further to prevent the entrance of air at these points, a fire-cement is filled in between 15 the surfaces 20 21, which, being refractory, will last as long as the burner is used.

D designates the deflector, which consists of an oval or rounded plate having closed ends 22 and a series of openings 23, arranged 20 along both sides, the center portion 24 of the plate being imperforated.

The form of burner just described is that adapted for use in cook-stoves; but for heating-stoves the circular burner, Figs. 4 and 5, 25 is employed. The principle of construction of this burner is the same as that shown in Figs. 1, 2, and 3, with the exception that the burner-body, cap-plate, and burner-plates are circular and the deflector is semi-spherical, 30 or approximately so, in shape. The core 4 is also dispensed with, and the service-pipe is tapped into the bottom of the burner-body, as clearly shown in Fig. 5.

Where the form of burner shown in Fig. 1 35 is to be employed in a grate, the core is dispensed with and the service-pipe is tapped into the bottom of the burner-body, as in the case of the circular burner shown in Figs. 4 and 5.

40 The reason that the core is employed upon the burner used in cook-stoves is that it would be highly inconvenient to manipulate the valve for regulating the flow of gas to the burner if the service-pipe were tapped into 45 the bottom of the burner-body. So in order to overcome this difficulty the service-pipe is let into the side of the stove and is tapped into one end of the core, thus bringing the regulator-valve within convenient reach.

50 The operation of my burner is as follows: The gas in entering the body of the burner passes out through the nozzle 8 and directly against the under side of the imperforated portion 24 of the deflector, which breaks its 55 force and causes it to be distributed throughout the entire length of the deflector, thus equalizing its pressure at all points in the burner-body. The gas then flows through the openings 23 in radial jets and fills the space

between the deflector and the burner-plates, 60 and finally escapes in numerous and equal jets through the openings in the said plates and the openings 13 to the upper surface of the cap-plate, where it is ignited and burns in a solid flame. As the burner-plates are located 65 some distance below the upper surface of the cap-plate, it follows that combustion does not take place until the gas has reached the top of the said cap, thus leaving a cushion of gas between the burner-plates and the edges 25 70 of the openings 13, which cushion serves to protect the said plates from burning, inasmuch as the point of combustion is always above the burner-plates, for the reason that the walls of the openings 13 prevent the ad- 75 mixture of oxygen with the gas until the latter reaches the top of the cap-plate. As this peculiar arrangement of parts serves to protect and to save that portion of the burner that is the most fragile and also the most 80 costly—namely, the burner-plates—its value may be readily appreciated.

In some instances where the gas-pressure is very low the deflector may be dispensed with, 85 and the force of the inflowing gas will be broken by contacting with the plate 14, which will also serve to spread it in the manner of the deflector.

Having thus fully described my invention, what I claim as new, and desire to secure by 90 Letters Patent, is—

1. In a gas-burner, the combination, with the body, of a cap-plate hermetically secured therein having a series of openings, a deflector 95 arranged within the body, having a series of perforations in its sides and an imperforated central portion, and perforated burner-plates secured to the under side of the cap beneath the said openings, the perforations in the de- 100 flector radiating toward the openings in the cap-plate.

2. In a gas-burner, the combination, with the body, of a cap-plate hermetically secured therein having a series of openings, a deflector 105 arranged within the body, having closed ends, a series of perforations in its sides, and an imperforated central portion, and perforated burner-plates secured to the under side of the cap beneath the said openings, the perfora- 110 tions in the deflector radiating toward the openings in the cap-plate.

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

HENRY E. EARLE.

Witnesses:

WM. HUNTER MYERS,
R. M. ELLIOTT.