No. 746,129.  Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

JOHN WESLEY McKNIGHT, OF HANOVER, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO W. F. KINTZING, OF HANOVER, PENNSYLVANIA.

REGENERATING GAS BURNER AND HEATER.

SPECIFICATION forming part of Letters Patent No. 746,129, dated December 8, 1903.

Application filed January 13, 1903. Serial No. 138,841. (No model.)

To all whom it may concern:

Be it known that I, JOHN WESLEY McKNIGHT, a citizen of the United States, residing at Hanover, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Regenerating Gas Burners and Heaters, of which the following is a specification.

My invention relates to improvements in gas-burners, and more especially to those of the class known as "regenerating-burners."

The principal object of my invention is to provide means for efficiently producing either heat with light or heat alone, as desired, and in connection therewith for so preparing the gas as to insure a perfect combustion thereof when ignited and used.

A further object of my invention is to provide means for securing a greater lighting or heating result from a given quantity of gas than may be obtained by means of burners now in use.

Another object of my invention is to provide means for securing such perfect combustion as to prevent the production and diffusion of noxious gases or of harmful compounds thereof.

I attain these means by the apparatus hereinafter fully described, which is also illustrated in the drawings which accompany and form a part of this specification.

In the drawings, Figure 1 is a central vertical section of a heating and lighting apparatus which embodies my invention and is adapted to be attached to a gas-bracket, and Fig. 2 is an elevation of a form of said apparatus adapted to be suspended from a gas-drop.

Corresponding parts of both figures are denoted by the same reference characters.

Referring to the drawings, 1 and 1' designate gas service-pipes, respectively used in connection with several methods of connecting the apparatus, as illustrated in the drawings, and each supplied with a cock 1" of any suitable form. The pipe 1 (see Fig. 1) projects horizontally a sufficient distance to be connected with the apparatus on the vertical center line of the latter by means of an elbow 2, on which is rigidly fixed a peripherally-screw-threaded flange 3, on which is screwed a regenerator 4, which is a gas-tight receptacle preferably constructed of externally-polished metal of circular horizontal cross-section throughout and of a modified peloidal form in central vertical section.

The pipes 1 and 1' may be used as supports for the burner or simply as means for attachment of the supply-tube, the burner being supported by other means as a base, the upper portion of which is shown at 13. A standing-pipe 5 is attached to the elbow 2 and extends to a point near the upper portion of the regenerator 4. One or more branch pipes 6, herein shown as two in number, are tapped into the lower part of the regenerator 4 and are respectively furnished with elbows 6' 6", one arm of each of which extends upwardly and carries a Bunsen burner, which in a general way is herein referred to by the numeral 7. Projecting upwardly from each burner 7 is a support 8, of lava or other suitable material, which supports an incandescent-light mantle 9. A globe 10 is fixed upon the elbow 2 by arms 10' 10" and forms an inclosure horizontally of the burners and of the portion of the regenerator 4 which extends from the flange 3 to the angle of the regenerator. A reticulated screen 11, preferably constructed of wire-netting, extends across the opening at the base of the globe 10. A conical reflector 12 may also be supported upon the arms 10" and surround the globe 10. A heating-drum 13 of cylindrical form and closed at its upper end by a dome 13' is secured by a collar 14 and set-screw 15 to a central support 16, as shown in Fig. 1, said support 16 being tapped into the center of the upper wall of the regenerator 4. The drum 13 extends downwardly to a plane below that of the angle of the regenerator 4. A pipe 17 may, if required, be let into the dome 13' and connect with a chimney-flue. (Not shown.) A number of perforations 13" 13" are shown in the drum 13 and afford communication from the interior of the latter to the outer air. In Fig. 2 the apparatus is shown suspended by a supply-pipe 1', which is furnished with a cock 1" and also acts as a support in place of the support 16, (shown in Fig. 1), and a collar 2', which is attached to the regenerator 4 by means of the flange 3 and a suitable con-
ction therefrom, supports the globe 10 by means of the arms 10', the pipes 1 and 5 and the elbow 3 not being used. In Fig. 2 the reflector 13 is shown in a reversed position and suspended from the lower edge of the drum 13. The apparatus may be provided with a base 18 and with a flexible or other suitable tubular connection (not shown) to either a gas-bracket or a gas-drop. When so connected, the apparatus may be arranged to rest upon the base 18 in any desired position upon a floor or other horizontal plane.

The operation and advantages of my invention will be readily understood and appreciated by those skilled in the art to which it appertains. Gas admitted to the regenerator 4 will flow outwardly through the branch pipes 6 to the Bunsen burners 7, where it may be ignited and burned. The regenerator and its contained gas will be heated by the combustion effect at the burners 7, and the gas thereafter flowing from the regenerator 4 to said burners will be "regenerated," or peculiarly prepared for combustion, by being heated as before mentioned, and will thus be supplied to the burners 7 in a form which will render it more effective for heating or lighting purposes than gas which has not been regenerated.

The term "regenerated" as used herein is intended to have the signification commonly understood thereby when used in the art to which my invention appertains, and the effective results thereof need not be mentioned at length herein, as I do not claim a regenerating apparatus, broadly, my invention relating simply to an improved apparatus by means of which said results may be obtained quite effectually and in an economical way.

An apparatus embodying my invention will produce high efficiency of lighting or heating effect from the gas consumed and will emit no deleterious products of combustion.

The supports 8 and mantles 9 may or may not be used, according to whether the apparatus is required for heating and lighting purposes combined or for heating purposes only. In either event, air which passes through the screen 11 is heated in the space between the regenerator 4 and the globe 10, thus increasing the effect of the heat imparted to the regenerator 4 and its contents by means of the burners 7. The heated air ascends into the heating-drum 13, where it continues to heat the contents of the regenerator 4, and the drum 13, also heated by said heated air, radiates heat from the outer surface, thus warming the apartment in which the apparatus is used.

I do not desire to be understood as limiting myself to the details of construction and arrangement as herein described and illustrated, as it is manifest that variations and modifications may be made in the features of construction and arrangement in the adaptation of the device to various conditions of use without departing from the spirit and scope of my invention and improvements. I therefore reserve the right to all such variations and modification as properly fall within the scope of my invention and the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A regenerating gas-burner, comprising a globe; a Bunsen burner inclosed within the walls of said globe; a regenerator partly inclosed within the walls of said globe and having a concave surface extending from a horizontal plane below that of the base of said burner to a vertical plane externally of the outer wall of said burner; a gas-supply pipe communicating with the interior of the regenerator; and a branch pipe communicating from the interior of the regenerator to said burner.

2. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; a regenerator partly inclosed within the walls of said globe and having a concave surface extending from a horizontal plane below that of the base of each burner to a vertical plane externally of the outer wall of each burner; a gas-supply pipe communicating with the interior of the regenerator; a branch pipe communicating from the interior of the regenerator to each burner, and a drum suspended above the globe.

3. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; a regenerator partly inclosed within the walls of said globe and having a concave reflecting-surface extending from a horizontal plane below that of the base of each burner to a vertical plane externally of the outer wall of each burner; a gas-supply pipe communicating with the interior of the regenerator; and a branch pipe communicating from the interior of the regenerator to each burner.

4. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; a regenerator partly inclosed within the walls of said globe and having a concave reflecting-surface extending from a horizontal plane below that of the base of each burner to a vertical plane externally of the outer wall of each burner; a gas-supply pipe communicating with the interior of the regenerator; a branch pipe communicating from the interior of the regenerator to each burner, and a drum suspended above the globe.

5. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; an incandescent light mantle surrounding each Bunsen burner; a regenerator partly inclosed within the walls of said globe and having a concave surface extending from a horizontal plane below that of the base of each burner to a vertical plane externally of the outer
wall of each burner; a gas-supply pipe communicating with the interior of the regenerator; and a branch pipe communicating from the interior of the regenerator to each burner.

6. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; an incandescent-light mantle surrounding each Bunsen burner; a regenerator partly inclosed within the walls of said globe and having a concave surface extending from the horizontal plane below that of the base of each burner to a vertical plane externally of the outer wall of each burner; a gas-supply pipe communicating with the interior of the regenerator; a branch pipe communicating from the interior of the regenerator to each burner, and a drum suspended above the globe.

7. A regenerating gas-burner, comprising a globe; one or more Bunsen burners inclosed within the walls of said globe; an incandescent-light mantle surrounding each Bunsen burner; a regenerator partly inclosed within the walls of said globe and having a concave reflecting-surface extending from a horizontal plane below that of the base of each burner to a vertical plane externally of the outer wall of each burner; a gas-supply pipe communicating with the interior of the regenerator, a branch pipe communicating from the interior of the regenerator to each burner, and a drum suspended above the globe.

In testimony whereof I have signed my name in the presence of the subscribing witnesses.

JOHN WESLEY MCKNIGHT.

Witnesses:
FRANK R. RODGERS,
SOLOMON HOKE.