(No Model.)

P. H. NELSON.

GAS BURNER FOR HEATING PURPOSES.

No. 472,198. Patented Apr. 5, 1892.

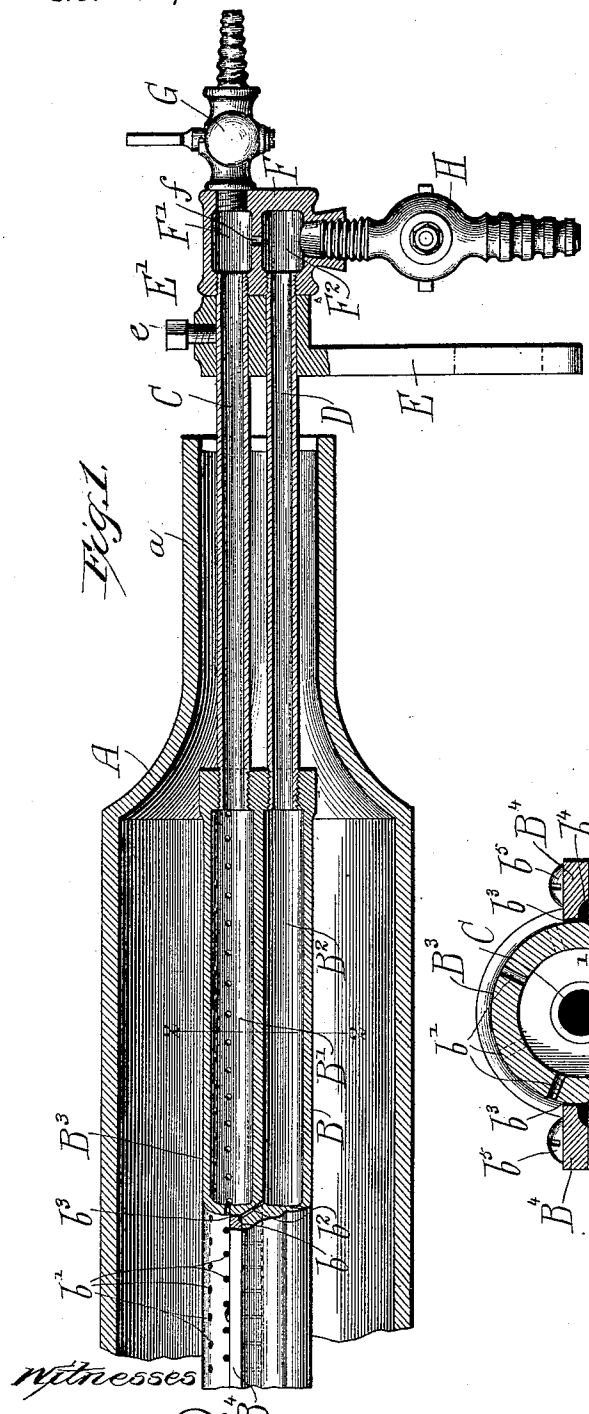

Fig. 1.

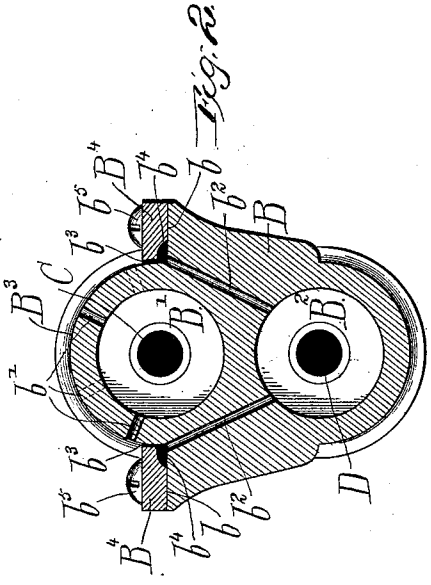

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

PETER H. NELSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE S. H. SINCLAIR COMPANY, OF SAME PLACE.

GAS-BURNER FOR HEATING PURPOSES.

SPECIFICATION forming part of Letters Patent No. 472,198, dated April 5, 1892.

Application filed April 23, 1891. Serial No. 390,096. (No model.)

To all whom it may concern:

Be it known that I, PETER H. NELSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Burners for Heating Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to burners for heating purposes, and more particularly to that class of burners of this description which are employed to heat hollow metal rolls, such as are used in ironing-machines and for other purposes.

The object of my present invention is to provide a burner of this class which shall be simple and cheap in construction and efficient in operation.

To these ends my invention consists in certain novel features, which I will now proceed to describe, and will then particularly point out in the appended claims.

In the accompanying drawings, Figure 1 is a longitudinal vertical section, partly in elevation, of a structure embodying my invention. Fig. 2 is a transverse sectional view taken on the line 2 2 of Fig. 1 and on an enlarged scale.

In the drawings, A represents the hollow roller to be heated, and *a* the hollow journal thereof, through which the pipes extend which supply the burner and support the same in the interior of the roller.

B represents the body portion of the burner proper, consisting of a single casting having an upper chamber B′, to which mixed gas and air are supplied under pressure in any suitable manner, such as that hereinafter set forth, and a lower chamber B^2, to which air under pressure is similarly supplied. The upper portion B^3 of the body B is preferably cylindrical externally as well as internally, and below this cylindrical portion B^3 the body B is extended laterally on both sides, so as to form substantially horizontal ledges or flanges *b*.

Through the top of the chamber B′ there are formed a plurality of diverging apertures *b*′, and from the chamber B^2 apertures or passages b^2 extend upward on each side to the inner edge of the ledges *b*, where they join the part B^3. These apertures or passages are formed in the body B and are arranged in two rows, one row on each side of the burner. On each ledge *b* there is mounted a strip B^4, extending the length of the burner and arranged with its inner edge a slight distance from the outer surface of the part B^3, so as to form between said part and the strip a narrow passage or slot b^3 of less width than the diameter of the apertures b^2 and extending the length of the burner on each side thereof and on each side of the apertures *b*′. The lower inner edge of each strip is cut away to form a chamber b^4 on each side of the burner, into which chambers the apertures or passages b^2 open, and from which chambers the slots b^3 lead to the exterior of the burner. The strips B^4 may be secured in place by screws b^5 or other suitable means.

C indicates a pipe, one end of which is screwed into the end of the body B and communicates with the gas and air chamber B′ therein. D indicates a similar pipe, also having one end screwed into the end of the body B and communicating with the air-chamber B^2 therein. These pipes support the burner proper within the roller A and are themselves supported at their outer ends by a bracket-arm E, adapted to be attached to the frame of the machine and having at its upper end a housing E′, with apertures to receive the pipes C and D, which are secured therein by a set-screw *e* or otherwise.

F represents a head-piece having chambers F′ and F^2, with the former of which the pipe C is connected, while the pipe D communicates with the latter chamber.

G indicates a cock communicating with the chamber F′ and adapted to be connected with any suitable source of gas-supply, and H indicates a similar cock connected with any suitable source for supplying air under pressure and communicating with the chamber F^2. A small passage *f* connects the chambers F^2 and F′.

The operation is as follows: Gas under pressure is admitted through the cock G to the chamber F′, while air under pressure is

admitted through the cock H to the chamber F^2. A portion of the air in the chamber F^2 will pass through the passage *f* into the chamber F′ and will mingle with the gas contained in said chamber, the mixture of gas and air thus obtained being carried through the pipe C into the chamber B′ of the burner, whence it issues from the diverging apertures *b′*, being ignited as it so issues. The air from the chamber F^2 passes through the pipe D into the chamber B^2 and thence through the apertures or passages b^2 into the chambers b^4, whence it issues in a continuous sheet at each side of the apertures *b′* through the slots b^3. The air thus issuing mingles with the burning mixture of gas and air issuing from the apertures *b′* and causes a complete combustion thereof, thus avoiding the depositing of soot on the interior of the roller, thereby maintaining the efficiency of action of the heating apparatus thereon. It will be observed that by the employment of continuous passages or slots b^3 of less width than the apertures b^2 and by interposing the chambers b^4 between the slots b^3 and the respective rows of apertures b^2, said chambers act as pressure-chambers, and thereby cause the air to issue in continuous sheets and with considerable force instead of issuing in jets directly from the apertures b^2, thus insuring a sufficient air-supply for each of the apertures *b′*.

What I claim is—

1. A burner comprising a unitary relatively-long body portion provided with two longitudinal spaces or recesses constituting an upper gas and air chamber and a lower air-chamber, a plurality of apertures or passages out of alignment and extending from the upper chamber to the top of the body, other apertures or passages extending from the lower chamber to the sides of the body, continuous pressure-chambers on each side, in which said last-mentioned apertures or passages terminate, and contracted longitudinal slots extending from said pressure-chambers upward to the sides of the portion of the body containing the gas and air outlet apertures, substantially as described.

2. A burner comprising a single relatively-long body portion provided with two longitudinal recesses constituting an upper gas and air chamber and a lower air-chamber, a plurality of apertures or passages extending from the upper chamber to the top of the body and out of alignment, other apertures or passages extending from the lower chamber to the sides of the body, lateral ledges or shoulders on the body proper at the upper ends of these latter passages, and a single strip secured on each of said ledges, arranged to form contracted longitudinal slots between their inner edges and the body, said strips being cut away or rabbeted at their lower inner edges to form continuous pressure-chambers intermediate, between, and connecting the air-passages and said slots, substantially as described.

3. In a burner for heating purposes, the combination, with a gas-chamber and an air-chamber integral in one head and arranged one above the other with a connecting-passage between them and suitable connections to said chambers, of a burner having gas and air chambers, one above the other, integral in one body, and provided with suitable gas and air outlet passages, two pipes arranged one above the other, having their ends secured to the head and the burner, respectively, and connecting the chambers of said parts in pairs, and a supporting-bracket engaging said pipes and adapted to be connected with the machine-frame, substantially as described.

4. In a burner for heating purposes, the combination, with two superposed chambers integral in one head and communicating with each other by a suitable passage, said chambers being connected with suitable supply-pipes and the body portion of the burner proper having similarly-arranged non-communicating chambers provided with air and gas outlets, of two superposed pipes connecting in pairs the chambers of the head with those of the burner proper, said pipes having their ends secured to the head and the body, respectively, and a bracket adapted to be connected with the machine-frame and having an enlarged part or housing with parallel apertures through which said pipes extend, and means for securing said pipes to said bracket, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

PETER H. NELSON.

Witnesses:
TAYLOR E. BROWN,
F. A. WALKER.