

F. E. DILLON.
GAS FEEDING AND MIXING DEVICE.
APPLICATION FILED MAR. 3, 1909.

953,820.

Patented Apr. 5, 1910.

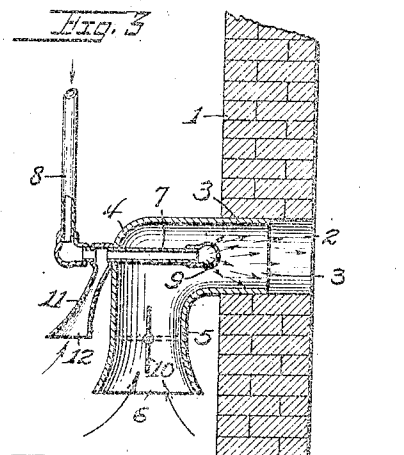
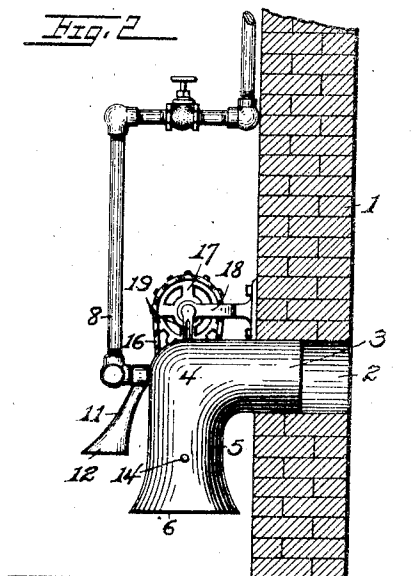
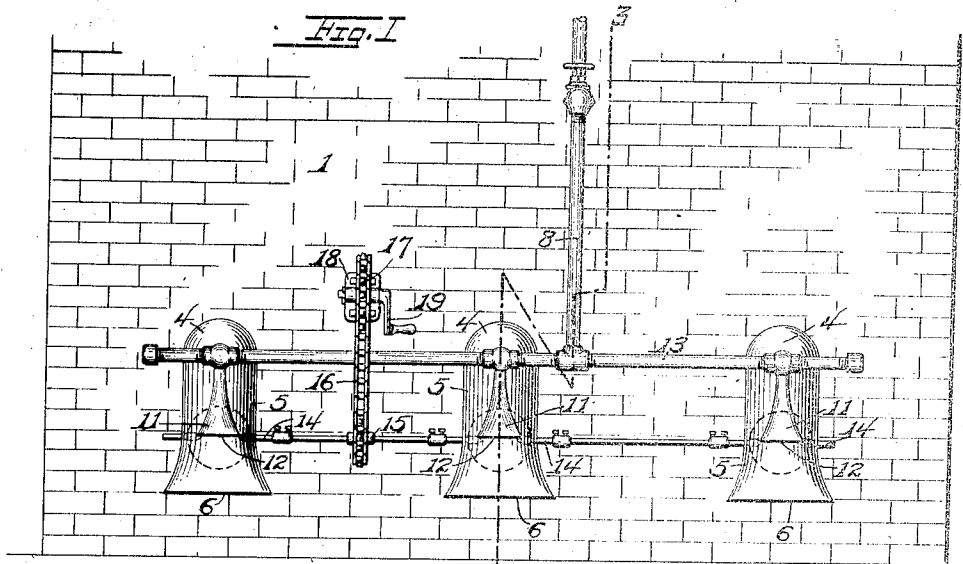


Fig. 4

WITNESSES:
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UNITED STATES PATENT OFFICE.

FRIEND E. DILLON, OF MARTINS FERRY, OHIO, ASSIGNOR OF ONE-FOURTH TO CHARLES H. COPP AND ONE-FOURTH TO E. S. DILLON, OF WHEELING, WEST VIRGINIA.

GAS FEEDING AND MIXING DEVICE.

953,820.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed March 3, 1909. Serial No. 481,101.

To all whom it may concern:

Be it known that I, FRIEND E. DILLON, a citizen of the United States of America, and resident of Martins Ferry, county of Belmont, and State of Ohio, have invented certain new and useful Improvements in Gas Feeding and Mixing Devices, of which the following is a specification.

This invention relates to improvements in gas burners for furnaces, and more particularly to a gas-feeding and mixing device for gas heating, annealing and other furnaces; and it consists in the particular construction, arrangement and combination of parts which will hereinafter be fully described.

The primary object of the invention is to provide a device which is adapted to be regulated for thoroughly mixing with air the gas supplied to a furnace, thereby effecting perfect combustion and materially reducing the quantity of gas required.

Another object is to provide a device whereby a blast may be supplied for directing the gas any required distance into the combustion chamber of the furnace.

A further object is to provide, in connection with a gas burner, means for mixing air with the gas prior to its discharge into the furnace, and means for further mixing air with the gas after it is discharged and before it reaches the point in said furnace where combustion takes place. And a still further object of the invention is to provide a simple and inexpensive device of the character mentioned having regulating means whereby the amount of air admitted for producing or effecting perfect combustion may be readily controlled.

In describing the invention in detail, reference is herein had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an elevation of a portion of a furnace showing a battery of devices embodying the feeding and mixing portions of the invention applied thereto, and illustrating the damper-operating mechanism; Fig. 2 is a vertical section of a furnace wall, illustrating the application of the invention, the latter being shown in side elevation; Fig. 3 is a section on the line 3—3, Fig. 1; and Fig. 4 is a perspective view of the gas-discharge nozzle, or burner.

Referring to said drawings, in which like

reference numerals designate like parts throughout the several views—1 indicates a furnace wall in which is provided one or more gas-feed openings 2 in which is fitted horizontally the cylindrical discharge end, or horn 3 of a substantially L-shaped, hollow metallic shell 4 whose opposite or receiving end or horn 5 stands substantially vertical on the outer side of said wall and has a flared or bell-shaped air-intake mouth 6. Directed horizontally through the wall of the shell 4 so as to stand substantially central of the discharge end 3 thereof is a branch gas-supply pipe 7 which leads from a supply pipe 8 and has a burner or nozzle 9 upon its end, as shown. While any appropriate form of nozzle may be employed, I prefer to use a nozzle of knob-shaped or bulbous formation having a plurality of perforations therein, as shown, such nozzle being particularly adapted for discharging the gas in different directions. As is obvious, the shell 4 provides for the thorough mixing of the air with the gas as it is discharged through the nozzle, a strong draft or suction being produced for drawing air through the shell into the furnace. A damper 10 is provided in the vertical horn or end 5 of the shell whereby the quantity of air admitted through the latter may be regulated.

For partially mixing the gas previous to its discharge from the nozzle, a horn-like mixing bell 11 is provided on the pipe 7 directly in the rear of the shell 4, as shown, said bell being inclined rearward, or away from said shell, and having its flared mouth 12 located at a point sufficiently remote from the intake mouth 6 of the shell that the draft through the former is not perceptibly disturbed by the inrush of air through the mouth of the latter.

From the foregoing it is apparent that a most thorough mixing of air with the gas is provided for by the construction described. The damper 10 being properly adjusted, the necessary amount or quantity of air required for producing perfect combustion is admitted. However, the shell not only provides for the proper mixing of air with the gas in the furnace, but also for the admission of a quantity of air with such force that it serves as a blast for directing said gas any desired distance into the furnace before combustion proper takes place.

The devices composing the invention may be applied to a furnace singly, or in the form of a battery, as shown in Fig. 1. In the latter case, a horizontal gas supply pipe 13 is provided from which the pipes 7 branch at the proper points, and the damper-spindles 14 journaled in the shells 4 are preferably connected or coupled together to form a common operating shaft. As a means of operating said shaft, for adjusting the connected dampers in unison, a sprocket wheel 15 may be located thereon and said sprocket wheel connected by a sprocket chain 16 to a second sprocket wheel 17 mounted on a suitable bracket 18, the latter being preferably mounted upon the furnace wall 1. A crank 19 mounted on the spindle of the wheel 17 is turned for effecting the manipulation of the dampers. The pipe 7 is of such length that when the nozzle 9 is applied thereto, the latter stands in the rear of the inner end of the opening 2. Thus, the air admitted through the shell is permitted to mix with the discharged gas prior to its entrance into the furnace. Further, through the force of the blast admitted through the shell, the whole body of the gas discharged may be directed to any desired point before combustion proper is permitted.

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

1. The combination with a furnace wall having a hole therein, of a hollow metallic L-shaped shell having one horn mounted horizontally within said hole and the other horn depending on the outer side of said wall, a gas-supply pipe directed horizontally through the wall of said shell and standing central of said horizontal horn, a burner nozzle on the end of said pipe, a damper for controlling the admission of air through said shell, and means associated with said pipe in the rear of said shell for mixing air with the gas prior to the discharge of the latter through said nozzle.

2. The combination with a furnace wall having a hole therein, of a hollow metallic

L-shaped shell having one horn mounted horizontally within said hole and the other horn depending on the outer side of said wall, a gas-supply pipe directed horizontally through the wall of said shell and standing central of said horizontal horn, a burner nozzle on the end of said pipe, a damper for controlling the admission of air through said shell, and a mixing bell connected to said pipe in the rear of said shell whereby a partial mixing of air with the gas is effected prior to the discharge of the latter through said nozzle.

3. The combination with a furnace wall having a hole therein, of a hollow L-shaped shell having one horn mounted horizontally in said hole and the other horn depending on the outer side of said wall, a gas-supply pipe directed horizontally through the wall of said shell and standing central of said horizontal horn, a damper for controlling the admission of air through said shell, and a horn-like mixing bell connected to said pipe in the rear of said shell and inclined away from the latter.

4. The combination with a furnace wall having a plurality of holes therein, of a hollow metallic L-shaped shell for each hole, one horn of said shell being directed horizontally into said hole and the other horn thereof hanging on the outer side of said wall, a gas-supply pipe directed through the wall of each shell and standing central of said horizontal horn, gas-spreading discharge means carried by the end of said pipe in the rear of the inner end of said hole, a damper for each shell, means for operating said dampers in unison, and means associated with each supply pipe whereby the gas is partially mixed with air prior to its discharge.

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

FRIEND E. DILLON.

Witnesses:

H. E. DUNLAP,
E. S. DILLON.