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GAS BURNER.

APPLICATION FILED NOV. 21, 1917.

1,313,360.

Patented Aug. 19, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

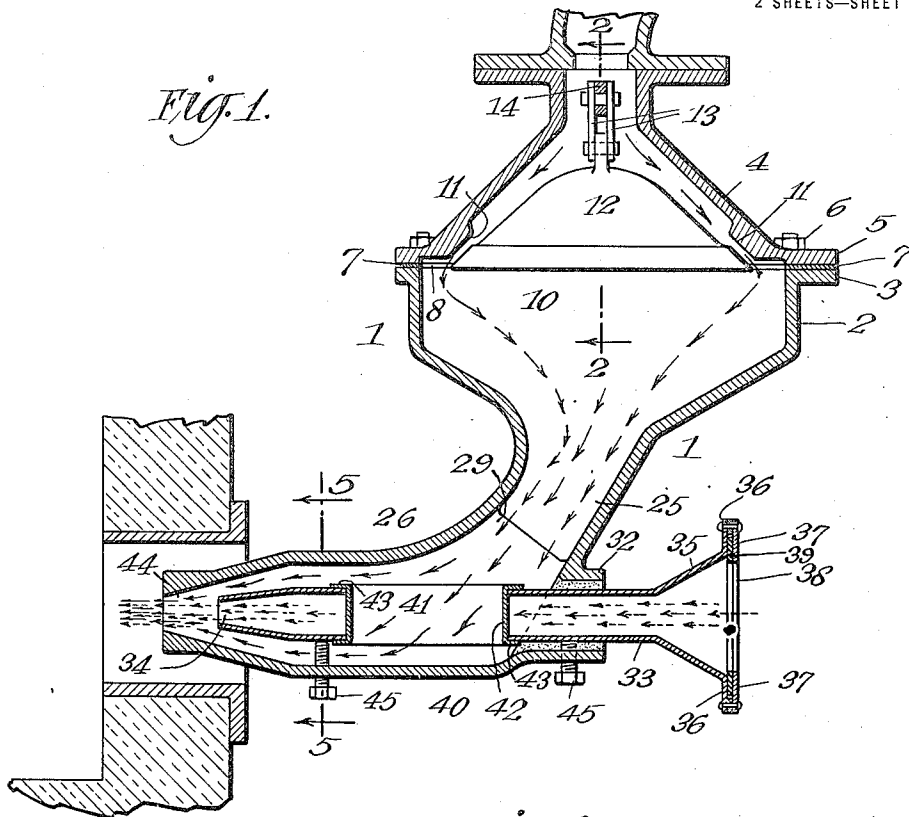
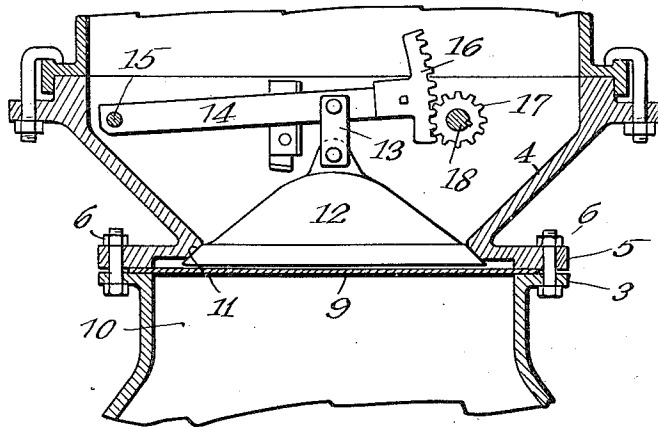


Fig. 2.

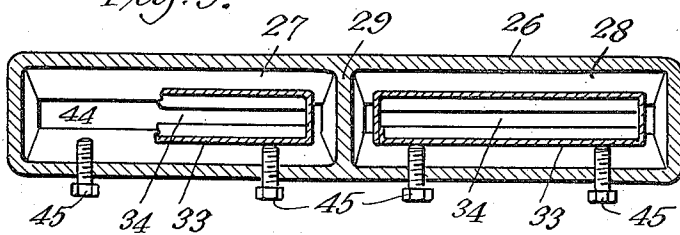


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GAS BURNER.

1,313,360.

2 SHEETS—SHEET 2.



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GAS-BURNER.

1,313,360.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CARL A. WENDELL and SAMUEL B. SHUTTS, citizens of the United States, residing in Rockville Center, Long Island, New York, and Marietta, Pennsylvania, respectively, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

Our invention relates to gas burners of large type adapted principally to utilize the gases emanating from blast furnaces, coke ovens or gas producers or other apparatus used in and around ore reduction and smelting and refining plants or the like.

One of the objects of our invention is to provide improved means for obtaining a complete admixture of the gas and air to improve the combustible qualities of the mixture. A further object is to provide a safety device in addition to the gas valve to positively prevent the possibility of gas leaking past said valve and thereby reaching the interior of the furnace while workmen are engaged in repairing or cleaning the furnace. A still further object is to provide a structure having adjustable features whereby the velocity and the nature of the mixture can be controlled, and which structure is simple in construction and inexpensive to manufacture, yet, efficient in its operation. To attain these objects our improved burner consists essentially of a gas conductor in the form of a hollow casing having a converging outlet. An air box having gas passages formed therethrough and provided with means for regulating the air entering said air box extends into the interior of the gas conductor and has a converging outlet terminating at a plane to the rear of the outlet of the gas conductor. The gas conductor is provided with a bell valve having clamping means whereby it may be locked in different adjusted positions, and the gas conductor is so constructed that at the time the bell valve is closed a deadplate may be secured in place to seal the inlet opening to said gas conductor.

The construction and operation of our improved burner will be more clearly understood by reference to the accompanying

drawings in which like characters refer to like parts in the several views and in which,—

Figure 1 is a staggered longitudinal sectional view through the center of the gas inlet and the center of one of the gas outlets, being taken substantially at the plane indicated by the line 1—1 of Fig. 3, the bell valve being shown in its open position;

Fig. 2 is a vertical sectional view of the upper portion of our burner on the line 2—2 of Fig. 1. The valve however in this view is shown in its closed position and the deadplate inserted below the same to positively seal the inlet opening;

Fig. 3 is a rear elevation of the burner being a view from the right of Fig. 1;

Fig. 4 is a detail perspective view of the air box showing the gas passages there-through and the means for regulating the volume of air passing into said air box;

Fig. 5 is a cross-sectional view on the line 5—5 of Fig. 1.

The burner casing indicated generally by the numeral 1 is flared at its upper end 2 and is provided with a flange 3 to which is secured a valve casing 4 having a flange 5, said valve casing being secured to the flange 3 by suitable bolts 6. Under normal operating conditions a gasket 7 having a gas opening 8 therein is interposed between the flanges 3 and 5. However at certain times a deadplate 9 shown in Fig. 2 is interposed between flanges 3 and 5 to seal the inlet opening 10 in the gas conductor. The valve casing 4 is provided on its interior with a valve seat 11 to cooperate with a bell valve 12 which valve is suspended by links 13 from an arm 14 secured to a rock shaft 15, which arm carries at its free end a toothed sector 16 meshing with a pinion 17 which is keyed to a shaft 18. The rotation of the shaft 18 will obviously raise or lower the bell valve 12 as required. To lock the bell valve in various adjusted positions an arm 19, Fig. 3, is secured to the shaft 18 and carries a spring clamp plate 20. A thumb screw 21 passes freely through the clamp plate 20 and is threaded into the arm 19. A flat plate 22 in the shape of a sector is interposed between the arm 19 and the

spring plate 20 and is secured by a bolt 23 at one end to the valve casing 4 and at its opposite end it is similarly secured to a bracket 24 which in turn is fastened to the flange 5 of the valve casing.

From this construction it is clear that the rotation of the arm 19 will cause the pinion 17 and the sector 16 to raise or lower the valve 12 as may be desired and by means of the clamp 20, thumb screw 21 and sector plate 22, the valve may be securely locked in any desired position.

Extending downwardly from the upper portion 2 of the gas conductor, is a neck 25 which is flared outwardly as shown in Fig. 3 and terminates in a forwardly extending nozzle portion 26 in which the chambers 27 and 28 (Fig. 5) are formed, these chambers being separated from each other by a baffle wall 29. At the rear of the chambers 27 and 28, apertures 30 and 31 (Fig. 3) surrounded by rearwardly extending ribs 32 are formed and the air boxes 33 project through these apertures and into the chambers 27 and 28 as shown in Figs. 1 and 5.

The air boxes, which are of novel construction, are in the present embodiment built up of sheet metal and are rectangular in cross-section, the outlet apertures 34 being of restricted area as compared with the typical sectional area thereby increasing the velocity of the air as it passes out of the air box. At the rear end the air boxes are flared as shown at 35 and flanges 36 are formed thereon to which are secured the guide plates 37 having apertures 38 formed therein. A plate 39 having apertures 40 of substantially the same dimensions as the apertures 38 is slidably mounted between the plate 37 and the flange 36. It is clear that by sliding the plate 39 the volume of air entering the air box may be variably controlled.

At points intermediate the end 34 and flange 36, gas passages 41 are provided in the embodiment illustrated. These passages are in the form of conduits 42 constructed of sheet metal which are flanged over at 43 and suitably secured to the top and bottom walls of the air box. With this construction, it will be readily seen that the air may pass into the air box through the apertures 38 and around the conduits 42 and out of the restricted apertures 34 as shown by the dotted arrows in Fig. 1, while the gas may pass through the passages 41 in conduits 42 and around the top and bottom of the air box as indicated by the arrows shown in full lines, Fig. 1. At a plane between the end of the air box and the converging outlet 44 of the gas conduits, the currents of gas and air will meet and due to the gas passages through the air box and the gradually decreasing area and the high velocity of the gas and air a thorough admixture of said gas and air will

take place thereby producing a highly combustible mixture.

By adjusting the air box longitudinally it will be clear that the area of the space through which the gas must pass may be either increased or decreased according to whether the air box is moved backward or forward. It follows that an increase or decrease of the area of the space through which the gas flows will naturally cause a corresponding variation of the velocity of the gas passing from the outlet 44 of the burner.

The air box is supported on screws 45 threaded into the casing of the gas conductor by means of which the position of said air box may be adjusted vertically. A longitudinal adjustment of the air box may be obtained by sliding the same in or out as varying requirements demand. When the proper adjustment is obtained the air box may be cemented or luted into place as shown in Fig. 1. The cement or binder used to hold the air box in place is such that it can be easily removed when adjustment is necessary.

Though we have described with great particularity of detail certain specific embodiments of our invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments described. Various modifications thereof in detail may be made by those skilled in the art without departure from the invention as defined in the following claims.

What we claim is:

1. A gas burner comprising a gas conductor including a chamber having a converging outlet, a valve for controlling the flow of gas to said chamber, a deadplate adapted to be located below said valve to seal the inlet to said gas conductor and means for mixing air with said gas.

2. A gas burner comprising a gas conductor including a chambered casing having a converging outlet, means for controlling the supply to said gas conductor, an air box within said casing for introducing air into said gas conductor, said air box having gas passages therethrough and being arranged for movement toward and away from the said converging outlet to vary the area thereof.

3. A gas burner comprising a gas conductor including a chambered casing having an outlet means for controlling the supply to said gas conductor, an air box consisting of an independently removable member having gas passages therethrough, said air box having a converging portion projecting into said gas conductor and being adjustable in the direction of the flow of gas and also substantially at right angles thereto to vary the size of the said gas outlet.

4. A gas burner comprising a gas conduc-

tor including a chambered casing having a
converging outlet, an air box having gas
passages therethrough and provided with
means for regulating the amount of air pass-
5 ing therethrough, said air box being con-
structed as a separate removable unit and
arranged to be initially adjustable with re-

lation to said converging outlet and then
fixedly secured in place.

In witness whereof we have hereunto 10
signed our names.

CARL A. WENDELL.
SAMUEL B. SHUTTS.