Sept. 27, 1938. C. A. ACHTERFELDT 2,131,701

GAS BURNER

Filed Dec. 6, 1937

Fig. 1

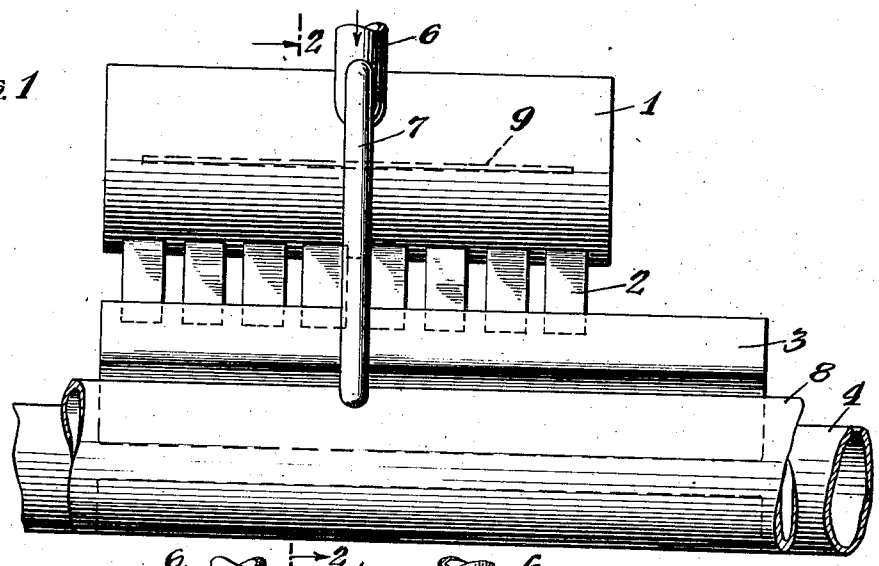


Fig. 2

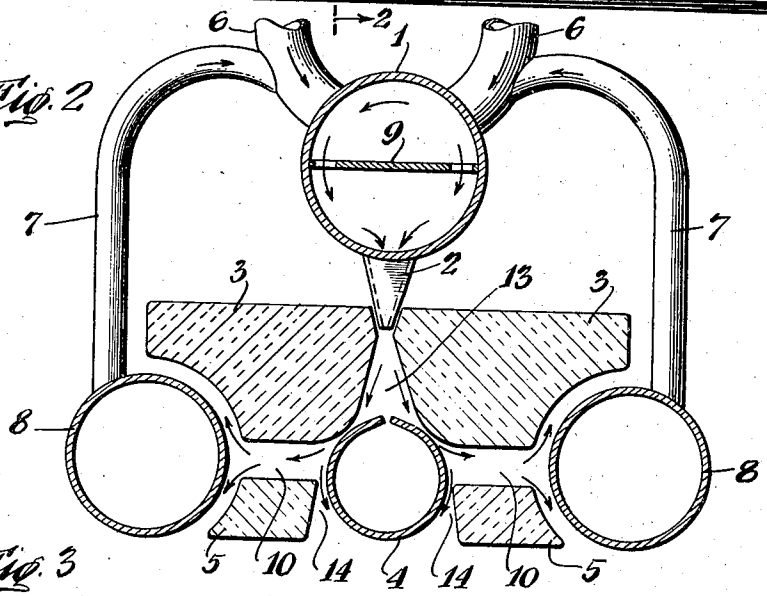


Fig. 3

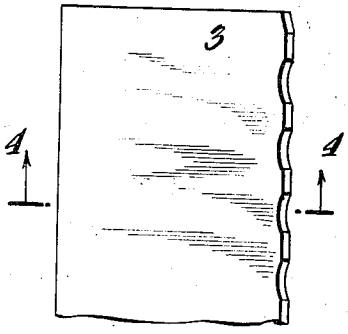
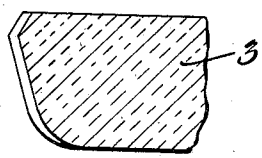


Fig. 4



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GAS BURNER

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In Germany November 16, 1936

5 Claims. (Cl. 158—104)

This invention relates to burners, and particularly burners for use in flame welding.

The present invention relates particularly to heating of metal parts which are to be united by gas or flame welding. Heretofore most of the burners used in heating parts to be welded have been provided with a gas-air mixture which was discharged out of a longitudinal slot or a number of separate nozzles dispersing the mixture through a longitudinal channel formed by material such as stones of fireproof or refractory composition so as to direct the gas-air mixture upon the welding seam in the work piece. In such devices the heating flame, after its contact with the weld seam, has been exhausted directly into the air in a highly inefficient and uneconomical manner. As a result such devices have only been suitable for gases having a high rate of ignition and a high burning temperature.

The present invention overcomes these difficulties by conserving the heated gases, preferably by placing fireproof or refractory materials between the gas-air mixture discharge nozzle and the material to be welded and additional fireproof or refractory elements at a desired distance from the material to be welded so as to form collecting and directing channels for the gases. These parts may be constucted so that they may be adjusted for different sizes of material to be welded and also so as to adjust the size of the channels through which the combustion gases escape after contacting the material to be welded. In this manner the heat is concentrated and the heated outlet channels, in addition to concentrating the gas, economize in the amount of gas necessary to produce a desired temperature and make it possible to obtain such temperature rapidly even when cheap quality gases are used which normally produce a low temperature. Furthermore, the heat collecting elements may be so arranged as to extend beyond the combustion area and serve as preheaters for the work to be welded.

Another feature of the invention is that the device is simple in construction, readily assembled from materials which are available and low in cost.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which:

Fig. 1 is a front elevation of my improved burner;

Fig. 2 is a vertical cross section of my improved burner, taken along the line 2—2 of Fig. 1;

Fig. 3 is a detail view of an element of the invention; and

Fig. 4 is a cross section on line 4—4 of the element shown in Fig. 3.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

The burner comprises basically a mixer pipe 1 into which combustion gases with a desired amount of air may be fed as by the pipes 6. Burner nozzles 2 of any desirable type such as are adapted to the gases used, serve as combustion nozzles and direct the flame toward the parts to be welded. Burner and collector elements 3 which form a channel 13, directing the gases discharged from the nozzles 2 against a work piece 4 may be adjustably mounted in the path of the flame to limit the size of the combustion chamber and predefine the heating area and the temperature to be reached or maintained. The collector elements 3 are held in proper spaced relation by any desired means such as adjustable angle irons or other well known devices.

In addition to the gas coming through the pipes 6 which may also have air mixed therewith, heated air in such volume as may be desired may be fed into the feeder pipes 6 from additional feeder pipes 7 which are preferably connected to preheaters 8. The preheaters 8 obtain air from any desired source, not here shown, and are heated by the combustion gases which pass through the channel 13 formed by the elements 3 and channels 10 formed by passages between the elements 3 and additional collecting elements 5 made of desirable fireproof or refractory material and mounted in any suitable adjustable bracket. The collecting elements 5 may be adjustably mounted and so positioned against the work material 4 that all of the gases escape through the channels 10, or spaced from the work piece 4 so as to provide additional outlet channels 14. It can be seen that as the mixture of gases passes through the channel 13 and impinges on the material to be welded, here shown as 4, the gases will be kept under control and directed through the channels 10 so as to pass around the preheaters 8. The temperature to which the air in the preheaters 8 is to be brought may be controlled as the collecting parts 5 are adjustably mounted so as to vary the width of the channel 10 between the parts 6

and 3 in relation to the channels 14 formed between the work piece 4 and the collecting elements 5.

To assure proper mixture of the gases in the mixer pipe 1, baffle plates 9 may be provided. These baffles 9, in addition to mixing the gases, may aid in expelling them through the nozzles 2 into the channel 13 where they ignite.

As is shown in Fig. 1, the heat and gas collecting elements 3 and 5 may extend beyond the combustion area. These may then serve as preheaters not only for the pipes 8, but for the work to be welded.

In operation, the gases for ignition may be turned on and allowed to burn either with or without any working of the device. As the gases start to burn, if they are relatively low combustion gases, the temperature within the area defined by the collector elements 3 and 5 may be below the welding temperature of the work to be welded. However, as they burn, the air in the preheaters 8 will be heated with consequent preheating of the gases of combustion. Furthermore, the collecting elements 3 will be heated and consequently the temperature of the combustion chamber defined by the elements 3 and 5 will be raised. It can thus be seen that gases which ordinarily would not produce a sufficient temperature for welding may be superheated to produce effective welding temperature.

By prolonging the elements 3 and 5 beyond the combustion area, preheating chambers may be formed. Thus, the work to be welded may be preheated so that where it reaches the welding area it will be very near its fusion point and its introduction into the combustion zone will not lower the temperature thereof substantially. Furthermore, such preheated chambers may aid materially in raising the temperature in the combustion chamber above the temperature normally attainable.

As the elements 5 are movable, once the desired temperature within the combustion area is reached, it may be maintained as by moving the elements 5 away from the work 4, the channels 14 will exhaust the desired amount of gas and prevent overheating.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described and ascertained my invention I declare that what I claim is:

1. A gas burner for flame welding, comprising a gas mixture pipe, means for supplying a combustible gas to said pipe, a plurality of discharge nozzles in said pipe, adjustable heat resistant elements adjacent said discharge nozzles defining a longitudinal slot, said discharge nozzles adapted to discharge said mixture between said elements, additional heat resisting elements spaced from said first elements and adapted in cooperation with said first elements and a piece of material to be welded to form an accumulating ring, preheating pipes connected to said mixture pipe and discharge channels formed by said heat resistant elements adapted to conduct said gases about said preheating pipes.

2. A burner for welding, comprising an air-gas mixer pipe, burner discharge nozzles therein, heat resistant gas accumulator elements adjacent said burner discharge nozzles, additional heat resistant gas accumulator elements spaced from said first mentioned elements and adjustable with respect thereto, said elements forming a combustion chamber, all of said heat resistant gas accumulator elements extending beyond the combustion chamber into which said burner discharge nozzles protrude, said gas accumulator elements defining channels therebetween adapted to exhaust the burned gases from said burner discharge nozzles, preheating pipes located in the exhaust path of said gases and pipes connecting said preheating pipes to said mixer pipe.

3. A burner for welding, comprising a mixer chamber, gas inlet pipes thereto, air inlet pipes connected therewith, burner discharge nozzles therein, heat and gas accumulating elements adjacent the end of said burner discharge nozzles adjustably mounted with respect thereto to form an elongate combustion chamber, additional heat and gas accumulator elements adjustably mounted and spaced from said first elements to form a heat and gas actumulating chamber, channels between said elements adapted to exhaust the gases, said elements and said chamber extending beyond the area occupied by said burner discharge nozzles, preheater pipes located adjacent said heat accumulating elements and in the path of the exhaust channels formed between said elements, said preheater pipes connected to said gas inlet pipes.

4. A burner for welding, comprising an air-gas mixture pipe, a discharge nozzle therefor, gas accumulating elements, air conducting pipes connected at one end to said mixture pipe and at the other end to a preheating pipe, said gas accumulating elements arranged to direct said accumulated gases upon said preheating pipe.

5. A burner for welding, comprising a combustion gas mixer pipe, gas inlet pipes connected thereto, air inlet pipes connected therewith, baffles in said mixer pipes adapted to aid in mixing said air and gas, burner discharge nozzles in said mixer pipe, elongate heat resisting and accumulating elements adjacent said burner discharge nozzles forming a combustion chamber, a second set of heat resisting and accumulating elements spaced from said first elements to a heat accumulating chamber, the spaces between said elements adapted to exhaust the gases from said chambers, preheated pipes adjacent said elements in the path of said exhaust pipes connecting said preheater pipes and said air inlet pipes, all of said accumulator elements extending beyond said combustion chamber forming a preheater chamber.

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