

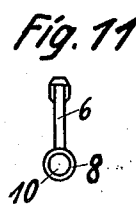
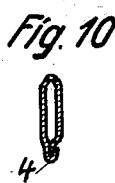
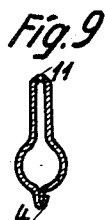
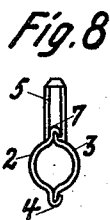
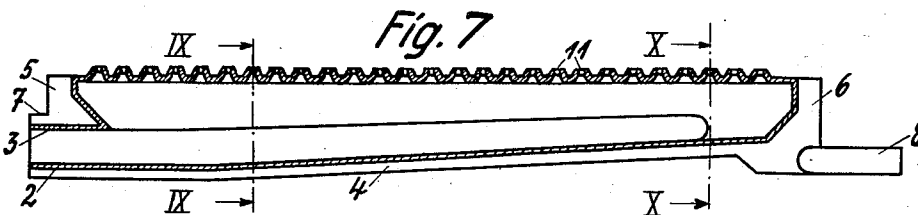
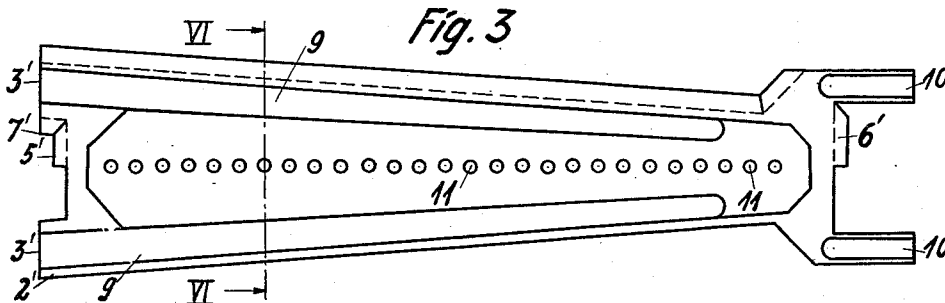
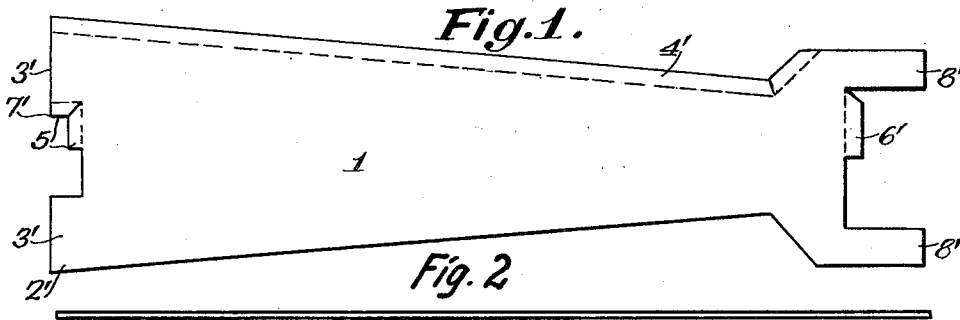
June 16, 1936.

H. GUHL

2,044,528

PROCESS FOR PRODUCING BUNSEN BURNERS

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UNITED STATES PATENT OFFICE

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PROCESS FOR PRODUCING BUNSEN
BURNERS

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Application December 6, 1933, Serial No. 701,227
In Germany January 26, 1933

6 Claims. (Cl. 113—116)

It is characteristic of Bunsen-burners, that within their mixing tube no substantial pressure exerts. The nozzle is open at the entrance of the mixing tube, carrying along fresh air by means of the injection-effect. The mixture of gas and air should be led with as little friction as possible towards the exit-openings for the flames. With burners of good construction this mixture escapes most uniformly from all burner holes. The flame, once being on, heats the surrounding air and thereby creates an upward motion, by which the mixture of gas and air is quickly carried outward from the inside of the burner. It is possible to feed more or less gas to the Bunsen-burner through the nozzle; in consequence of which the flame will enlarge or decrease correspondingly or will be more or less luminous according to the proportion of the mixture of air and gas supplied to the flame. The feeding of gas through the nozzle may be changed only to a certain degree, i. e. only to the extent that the holes for the flames are able to use up the mixture of gas and air. Otherwise the gas would be pressed back from the burner towards the nozzle and would escape there. With modern Bunsen-burners this dangerous limit is not reached, as within the tube no substantial pressure prevails.

Therefore it is not necessary to manufacture burners for gas-ranges or cookers in such manner, that they are completely closed gas-tight. Experiments have proven, that it is in many cases superfluous to weld or braze a burner gas-tight in all places. It will be sufficient to manufacture the burner by means of strong pressing or folding. However some kind of labyrinth-packing may be provided for further sealing.

Folding, which is done in cold state is a much cheaper manufacturing process and much more exact than welding and brazing. Heating and the expensive gases and compressed air, required for this purpose, are superfluous. Besides tension, resulting from welding long seams and sometimes causing warping of the burner, if it continually changes from warm to cold in the daily use, is avoided. The burner according to the present invention avoids these drawbacks. The manufacture of the form of the burner as well as the folding can be done on the same press. The fold itself serves as reinforcing feather protecting the burner against warping so that the burner may be manufactured of thin sheet-metal in order to reduce the manufacturing expense. The fold may be used as tappet for rotary burners.

If in modern burners the mixture of gas and

air is sucked-in under a partial vacuum, the velocity of the streaming gas will be greater than the igniting-velocity and therefore no gas can leak out through the folds. It is likely, that a tendency to suck-in additional air exists. By utilizing this possibility, a Bunsen-burner of this kind will not be deteriorated but improved, because by these means a mixture of gas and air may be carried towards the flames, containing more air and less gas than would be the case with normal burners, hence this burner must be more economical than those used up to the present time.

It is a well known fact, that gas burners may be composed of several pieces and the danger of leaking increases with the number of parts and the number of packing places. The drawbacks of these well known burners will be avoided by the invention in a simple manner by manufacturing the burner out of one single piece of sheet-metal so that the extent of the seams will be confined to a minimum. One pressing is sufficient for finishing the burner. This advantage in the manufacturing method produces a substantial reduction of the manufacturing costs while at the same time improving the solidity of the burner.

In the accompanying drawing the steps in the manufacture of a gas burner according to this invention are illustrated.

Figure 1 is a plan view of a piece of sheet metal preliminarily shaped to be manufactured into a gas burner by stamping and folding operations; A sealing material, such as linseed oil, cement, paper, asbestos or other packing materials can be incorporated into the fold if desired.

Figure 2 is an elevational view of Fig. 1;

Figure 3 is a plan view of the blank illustrating the initial embossing and perforating operation;

Figure 4 is a left end view of the initially embossed and perforated blank of Fig. 3;

Figure 5 is a right end view of the initially embossed and perforated blank of Fig. 3;

Figure 6 is a sectional view of the blank of Fig. 3 on the line VI—VI;

Figure 7 is a vertical longitudinal sectional view of the completed burner;

Figure 8 is a left end view of Fig. 7;

Figure 9 is a transverse sectional view on the line IX—IX of Fig. 7;

Figure 10 is a transverse sectional view on the line X—X of Fig. 7; and

Figure 11 is a right end view of Fig. 7.

Figures 1 and 2 of the drawing represents the initially shaped blank of sheet metal from which

a burner is manufactured. The shape of the initial blank must depend upon the desired shape and features of the finished burner. It is desirable that the finished burner shall have a progressively decreasing cross sectional area of flow for the gas and admixed air in order to feed the extensive line of burner openings uniformly. The blank 1 is, therefore, formed of generally tapering form from one end to the other. At the inlet end 2 the burner should have a tubular extension 3 either to fit on a feeding pipe or to loosely receive a smaller gas jet injector leaving space for air to be drawn in by the injector action. At the corresponding end 2' of the blank extensions 3' are, therefore, provided and from which the tubular extension 3 will be formed.

Because of the great length of the type of burner illustrated, it is desirable to provide means for supporting it at the end opposite the inlet end. In Figs. 7 and 11 a suitable supporting extension 8 is shown. This extension is formed by shaping and bringing together the two extensions 3', Fig. 1.

In the initial cutting out of the blank of sheet metal of which the burner is to be formed, a longitudinal center line is assumed, and it is along this line that the burner openings are to be formed. The blank is formed symmetrically about this center line, except for the provision of an additional strip 4' along one longitudinal edge of the tubular portion which is to be turned over or about the opposite edge to close the seam, as shown at 4 in Figs. 7, 8, 9 and 10. At each end of the blank on one side of the center line, strips or flaps 5' and 6' are also provided for closing the seams along all or part of the ends of the tube as shown at 5 and 6 in Figs. 7, 8 and 11. Also a strip or flap 7' is provided along the inner edge of one of extensions 3' for the purpose of forming a tight seam along the upper edge of the tubular extension 3 as shown at 7 in Figs. 7 and 8.

After the blank has been cut to the proper shape, the burner may be completed by cold stamping operations. The first operation is to emboss the blank with a pair of converging longitudinal grooves 9 extending from the inlet end to adjacent the opposite end, these grooves being symmetrically disposed with respect to the center line. Preferably these grooves are of diminishing cross sectional area from the inlet end toward the opposite end. At the same time the extensions 8' may be provided with parallel longitudinally extending grooves 10, Figs. 3, 5 and 11, and also the burner perforations 11 may be formed along the center line. The blank, so prepared, is then folded longitudinally about the center line and the strips or flaps 4', 5', 6' and 7' are folded over the adjacent corresponding edges. The burner is thus complete and ready for installation and use. By this process the finished burner is made cheaply and expeditiously from a single piece of ordinary sheet metal by simple cutting, bending and pressing operations. The burner so produced has the advantages of having relatively few seams, no internal stresses which might cause warping, great strength by reason of the reinforcing effect of the interfolded seams, and no possibility of becoming loose or disassembled as only one single piece is present.

I claim:

1. Process for producing tubular Bunsen burners for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other,

said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at one end spaced apart symmetrically with respect to the center line, said blank also having flaps along one longitudinal edge and along both ends on one side of the center line, the flap at the end having extensions terminating within the adjacent extension, perforating said blank with a series of perforations extending along the center line, folding the blank about the center line and bringing the edges together, and folding the flaps about the corresponding adjacent edges along the length and ends of the burner.

2. Process for producing tubular Bunsen burners for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other, said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at one end spaced apart symmetrically with respect to the center line, one of said extensions having a flap extending along its inner edge, said blank also having flaps along one longitudinal edge and at each end on one side of the center line, the end flap at the end having the extensions extending to the adjacent extension, perforating said blank with a series of perforations extending along the center line, embossing said blank with a pair of longitudinal grooves extending from the inlet end toward the opposite end and symmetrically disposed with respect to the center line, folding the blank about the center line and bringing the edges together, and folding the flaps about the corresponding adjacent edges along the length of the burner, and the upper edge of the burner inlet tube, and at the ends of the burner.

3. Process for producing tubular Bunsen burners for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other, said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at one end spaced apart symmetrically with respect to the center line, said blank also having flaps along one longitudinal edge and along both ends on one side of the center line, the end flap adjacent the extension terminating within said extension, perforating said blank with a series of perforations extending along the center line, folding the blank about the center line and bringing the edges together, folding the flaps about the corresponding adjacent edges along the length and ends of the burner, and incorporating a sealing material in the folded seams.

4. Process for producing tubular Bunsen burners for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other, said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at each end spaced apart symmetrically with respect to the center line, said blank also having flaps along one longitudinal edge and along both ends on one side of the center line between the extensions, perforating said blank with a series of perforations extending along the center line, folding the blank about the center line and bringing the edges together, and folding the flaps about the corresponding adjacent edges along the length and ends of the burner.

5. Process for producing tubular Bunsen burn-

ers for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other, said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at each end spaced apart symmetrically with respect to the center line, said blank also having flaps along one longitudinal edge and along both ends on one side of the center line between the extensions, one of said extensions at the inlet end having a flap extending along its inner edge, perforating said blank with a series of perforations extending along the center line, embossing said blank with a pair of longitudinal grooves extending from the inlet end toward the opposite end and symmetrically disposed with respect to the center line, folding the blank about the center line and bringing the edges together, and folding the flaps about the corresponding adjacent edges along the length of

the burner, and the upper edge of the burner inlet tube, and at the ends of the burner.

6. Process for producing tubular Bunsen burners for cooking ovens comprising stamping from sheet metal a single blank of elongated shape generally tapering from one end toward the other, said blank being generally symmetrical about a longitudinal center line and having a pair of longitudinal extensions at each end spaced apart symmetrically with respect to the center line, said blank also having flaps along one longitudinal edge and along both ends on one side of the center line between the extensions, perforating said blank with a series of perforations extending along the center line, folding the blank about the center line and bringing the edges together, folding the flaps about the corresponding adjacent edges along the length and ends of the burner, and incorporating a sealing material in the folded seams.

HERMANN GUHL.

CERTIFICATE OF CORRECTION.

Patent No. 2,044,528.

June 16, 1936.

HERMANN GUHL.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant and in the heading to the printed specification the residence of the patentee was erroneously given as "Baden, Germany", whereas said residence should have been given as Karlsruhe in Baden, Germany, as shown by the records of this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of September, A. D. 1936.

Henry Van Arsdale

(Seal)

Acting Commissioner of Patents.