Sept. 14, 1965 N. SHORR ETAL 3,205,932

MANUFACTURE OF GLASS

Filed June 19, 1961

FIG. 2

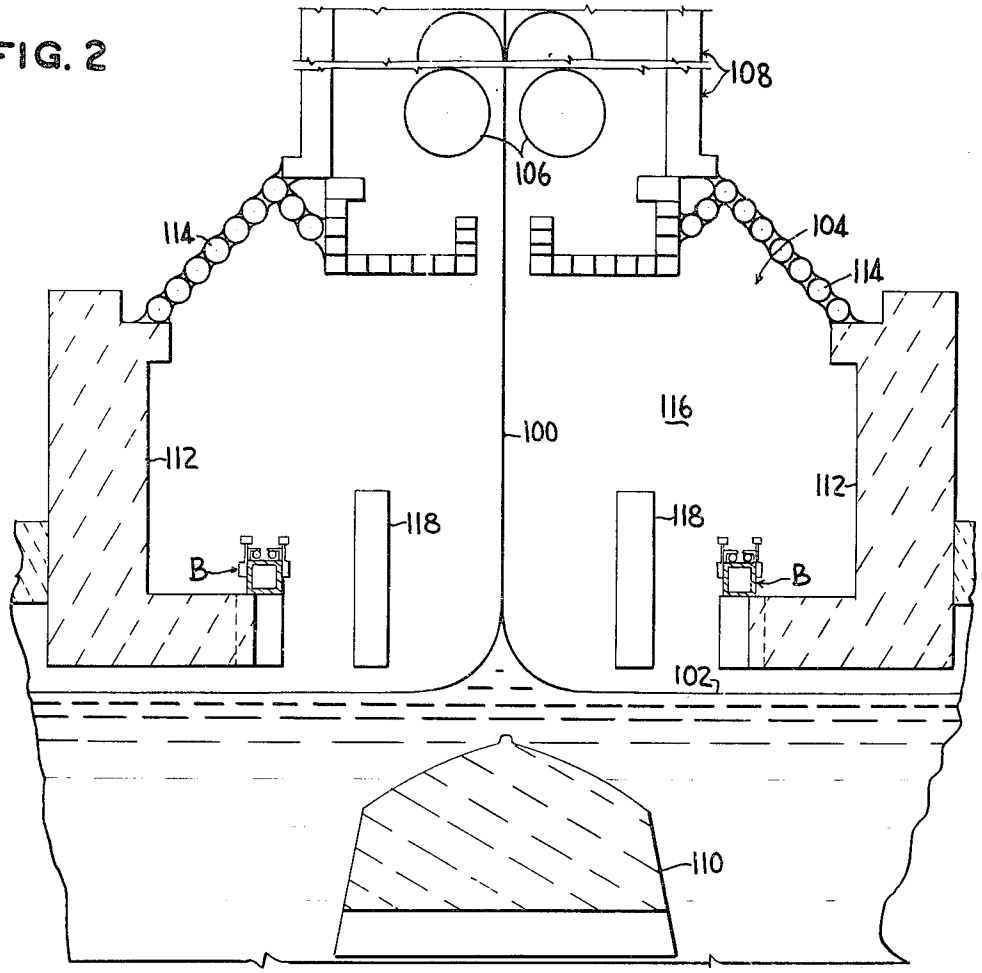
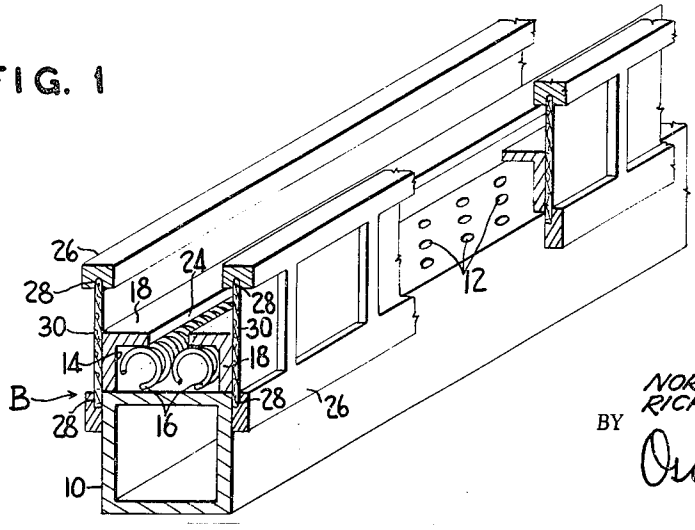


FIG. 1



INVENTORS
NORMAN SHORR and
RICHARD P. PAROBECK

BY Oscar A. Spencer

ATTORNEY

United States Patent Office

3,205,932
Patented Sept. 14, 1965

3,205,932

MANUFACTURE OF GLASS

Norman Shorr, Mount Lebanon, and Richard P. Parobeck, Brackenridge, Pa., assignors to Pittsburgh Plate Glass Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed June 19, 1961, Ser. No. 118,079
6 Claims. (Cl. 158—7)

This application relates to the manufacture of sheet glass and more particularly to an improved gas burner for use in a sheet glass drawing chamber.

In the manufacture of sheet glass, gas burners are employed in the drawing chamber for influencing air currents which occur therein and which affect the appearance, or, as referred to in the art, pattern of the glass. Examples of burners within sheet glass drawing chambers are found in United States Letters Patent to Brichard, No. 2,693,052, issued November 2, 1954, entitled Process of and Apparatus for Drawing Glass, and the copending application for United States Letters Patent of Robert A. James and Cecil R. Ward, Serial No. 771,393, now Patent No. 3,097,942, filed November 3, 1958, entitled Manufacture of Glass. The main purpose of such burners is to provide strong convection currents of gases, so as to influence the normally occurring air currents within the drawing chamber. To do so, a high velocity mixture of air and combustible gas is fed to the burners. However, because of the high velocity of the gas mixture, the flames of the burners have a tendency to "blow-off," i.e., lose their flame, so that the stability of the drawing operation is affected. The uniformity of the product is also seriously affected. In addition, burners emit radiant energy to the drawing chamber, already at a high temperature, resulting in a slow-down of the sheet cooling process. Such a slowdown in the cooling of the sheet causes a loss in the rate of sheet production which is not desirable.

In our copending application, Serial No. 118,080, filed concurrently herewith, there is described and claimed a burner structure for eliminating some of the difficulties enumerated above. The burner structure of the copending application is described as having means to absorb radiant energy emitted by the burner, in addition to other desirable features, such as a flame retainer to eliminate "blow-off," a combustion chamber for insuring substantial combustion of the combustible and gaseous and flame discharge restriction means.

The burner structure to be described herein incorporates the enumerated desirable features of the burner structure described in the aforementioned copending application and, while it does not incorporate the radiant energy absorbing means, it incorporates means to reflect radiant energy and constrain such energy, so that it does not influence the surroundings where the burner is used.

Attention is now directed to the drawings forming a part of this specification in which like reference characters refer to like parts and

FIG. 1 is an isometric view of a burner constructed in accordance with this invention, and

FIG. 2 is a schematic illustration of a sheet glass drawing apparatus embodying the burner structure to be described.

Reference is now made to FIG. 1 which shows the burner, generally identified as B, comprising an elongated tubular member **10** for connection with a supply of combustible, generally a mixture of air and combustible gases having a plurality of nozzle openings **12** therethrough for the passage of such combustible into a combustion chamber **14**. A pair of coils **16** overlie the nozzle openings **12** within the combustion chamber **14** and act as flame retainers to prevent and eliminate "blow-off." These coils are preferably constructed of nickel wire or ceramic or other high heat resistant material and become heated to incandescence and ignite the combustible issuing from the nozzle openings **12**. A pair of angle members **18** partly define the combustion chamber **14** and are retained in assembled relationship by connection to the tubular member **10** and a slot **24** is thereby defined through which flames and products of combustion pass from the combustion chamber **14**. The slot **24** gives directionality as well as an increased velocity to the flames and products of combustion.

Brackets **26** with tracks or slots **28** are connected to the tubular member **10** to support elongated flat plates **30** of radiant energy reflecting material such as fibrous potassium titanate, or metal backed asbestos board or other known radiant energy reflecting material. These plates reflect and retain the majority of the emitted radiant energy and prevent its lateral entry into the location wherein the burner is used. The plates **30** also assist the slot **24** and enhance the directionality imparted to the flames or products of combustion of the burner structure **3**.

Turning now to FIG. 2, there is schematically shown a sheet of glass **100** being drawn from a molten bath of glass **102** through a drawing chamber **104** by means of pairs of rolls **106** of a drawing machine **108**. A refractory draw bar **110** submerged within the bath **102** defines the plane of draw and stabilizes the sheet **100**. The drawing chamber is defined by the bath **102**, L-blocks **112**, the base of the drawing machine **108**, ventilator coolers **114** and side walls **116** and machine coolers **118** are positioned to extend the width of the chamber **104** on opposite sides of the sheet **100**. The burners B are positioned on the horizontal portions of the L-blocks, so that their flames and products of combustion are directed generally upwardy or somewhat toward the sheet **100**.

The burners *b* influence the air currents in the manner as taught by the aforementioned James and Ward application and improve the operational stability of that process. Of course, other embodiments of this invention will be apparent without departing from the spirit and scope of the invention as defined by the appended claims.

We claim:

1. A gas burner comprising an elongated tubular member for connection to a source of combustible gas, a plurality of nozzle openings in said member for passage of said combustible, flame retainer means overlying said openings, means overlying said flame retainer means to restrict the flame width, and means to reflect radiant energy emitted by said burner and prevent its lateral emission to the surroundings in which the burner is used.

2. A gas burner as recited in claim **1** wherein said reflecting means comprises flat plates coextensive with said tubular member and adjacent the sides thereof, said reflecting means extending to above said flame retainer means.

3. A gas burner as recited in claim **2** wherein said reflecting means comprises plates, of fibrous potassium titanate.

4. A gas burner comprising an elongated tubular mem-

ber to connection to a source of combustible gas, a plurality of nozzle openings in said member for passage of said combustible, flame retainer means overlying said openings, means overlying said flame retainer means to provide directionality and increased velocity to flames and products of combustion from said burner, and means to enhance the directionality of the flames and products of combustion of said burner comprising flat plates connected to said tubular member and extending therefrom.

5. Apparatus for drawing sheet glass from a bath of molten glass comprising a cooled drawing chamber, and at least one burner for influencing the air currents in the drawing chamber, said burner including a tubular member extending substantially the width of the drawing chamber for connection to a source of combustible gas, a plurality of nozzle openings through said tubular member, a flame retainer for said burner, means overlying said flame retainer means to restrict the flame width, and means to reflect radiant heat emitted by said burner so as to prevent its lateral emission to said chamber.

6. Apparatus as recited in claim 5 wherein said reflecting means is a flat plate of fibrous potassium titanate positioned adjacent said tubular member.

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JAMES W. WESTHAVER, *Primary Examiner.*

FREDERICK L. MATTESON, PERCY L. PATRICK, *Examiners.*