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J. A. REECE

REHEATING BURNER FOR SHEET GLASS

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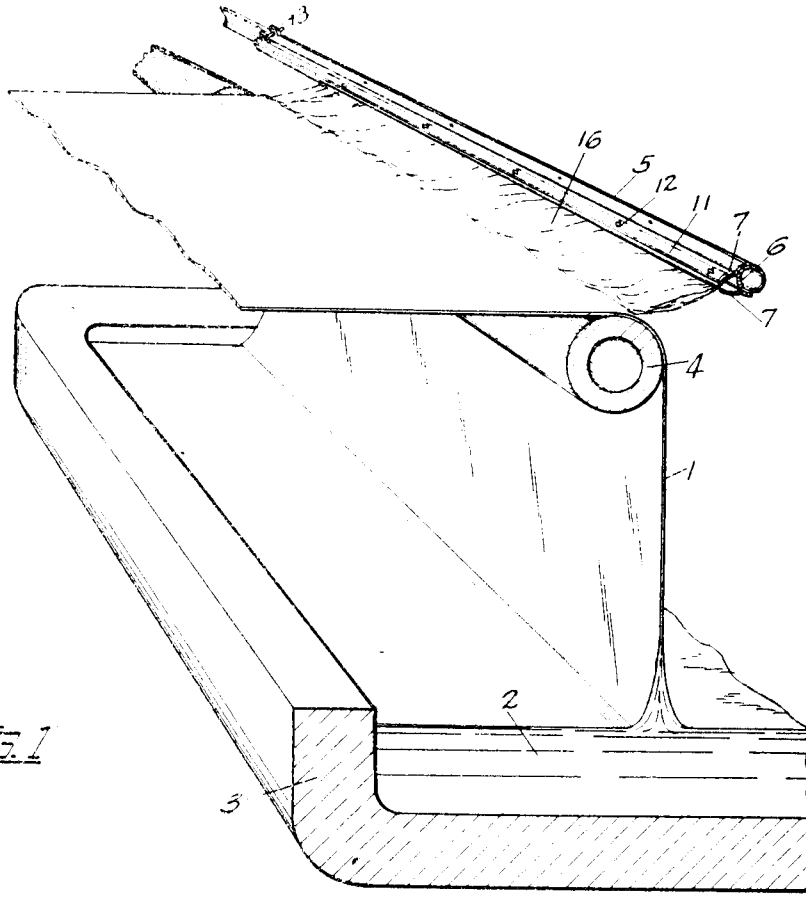


FIG. 1



FIG. 2

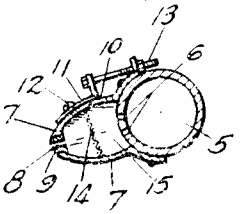


FIG. 3

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UNITED STATES PATENT OFFICE.

JOSEPH A. REECE, OF TOLEDO, OHIO, ASSIGNOR TO THE LIBBEY-OWENS SHEET GLASS COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

REHEATING BURNER FOR SHEET GLASS.

Application filed February 23, 1924. Serial No. 694,663.

To all whom it may concern:

Be it known that I, JOSEPH A. REECE, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Reheating Burners for Sheet Glass, of which the following is a specification.

This invention relates to improvements in the art of drawing sheet glass, and more particularly to an improved type of gas burner for reheating the sheet at an intermediate stage of the sheet-forming operation.

In the Colburn system of drawing sheet glass, wherein the sheet is drawn upwardly from a bath of molten glass, and then while still somewhat plastic bent into the horizontal plane about a cooled bending roller, a reheating burner is positioned above the bending roller for reheating the glass sheet as it leaves the roller. This burner is disclosed and claimed in the patent to Deulin 1,411,079, granted March 28, 1922. In the form there disclosed this roller comprises a longitudinal gas pipe, positioned parallel to the sheet-carrying surface of the roller, provided with a longitudinal series of spaced holes or openings through which the gas flows out to form a continuous row of flames playing on the surface of the glass sheet.

The present invention discloses an improved type of this burner which will produce a flat even sheet of flame across the entire width of the glass sheet, this flame being cleaner and hotter than the flames produced by the mechanism heretofore in use.

At each side of the series of holes or openings in the gas pipe is positioned a plate or deflector, the outer edges of the two plates being arranged closely adjacent one another to provide a long continuous slot therebetween. One of the plates has a series of openings in its side to admit air to the mixing chamber between the plates, and this mixture is forced out through the slot by the force of the emerging gases and combustion takes place beyond the slot in the form of a long flat even sheet of flame. An adjustable slide valve is positioned over the air openings in one of the plates to regulate the proportion of air in the combustion mixture. A fine-meshed screen positioned between the two plates will remove dirt or other foreign substances that may find their way into the gas supply, and thus prevent the projection of such impurities onto the glass sheet.

The invention will be more clearly understood from the following detailed description of one approved form of the apparatus.

In the accompanying drawings:

Fig. 1 is a perspective of the improved burner and the adjacent portions of the sheet-drawing mechanism, the front portion of this view being shown in longitudinal vertical section.

Fig. 2 is a plan of the burner looking from above.

Fig. 3 is a transverse section through the burner.

The glass sheet 1 is drawn upwardly from the mass of molten glass 2 in receptacle 3, and while substantially in final sheet form but still somewhat plastic is deflected about the cooled bending roller 4 into the horizontal plane. By this time the sheet has become so cooled by radiation and contact with the cooled roller 4, that it is necessary to reheat the same to prevent the formation of corrugations by the curved surface of the roller, and to allow the sheet to be properly flattened as it is drawn away in the horizontal plane. For this purpose the burner 5 is provided.

This burner consists of a longitudinal gas pipe positioned parallel with the sheet-carrying surface of roller 4, and provided with a row or rows of holes or openings 6 through which the gas is forced from the pipe to supply the reheating flames. At each side of the series of openings 6 a plate or deflector 7 is positioned, these plates being substantially of the form best shown in Fig. 3. The plates are fastened at their inner edges to the sides of gas pipe 5 and their outer edges are slightly spaced apart to provide a long narrow slot 8 therebetween. These edges of the members 7 may be faced with porcelain or other heat-resisting material as shown at 9. The upper plate 7 is provided with a series of openings 10 to admit air to the chamber between the two plates to form the combustion mixture. A valve plate 11 extending longitudinally of the plate 7 above the several openings 10, is secured to the plate by a series of screw bolts 12 operating through slots in the valve plate, so that this plate may be adjusted to close more or less, the openings 10. A screw bolt 13 at either

end of the valve plate is provided to regulate this adjustment.

Mounted between the two plates 7 is a fine-meshed screen 14 through which the air and gas must pass before reaching the exit slot 8. This screen tends to collect and remove from the combustion mixture any fine particles of dirt or other foreign matter that otherwise might be projected into the flames.

The mixture of air and gas collected in mixing chamber 15 between the two plates 7 is projected by the force of the gas streams issuing from pipe 5 through the slot 8 where combustion takes place in the form of a long continuous flat sheet of flame 16 which may be directed against the surface of the glass sheet 1 just as it leaves the bending roller 4.

It will be noted that by passing the gases through this mixing chamber 15 and continuous slot 8, the series of individual flames that would otherwise be formed beyond the holes 6 are combined into one continuous sheet of flame, and at the same time the proper mixture of air and gas is formed within chamber 15 before the mixture is projected through slot 8. The action of the flame will be much the same as that of the well-known Bunsen burner, producing a rather intense hot flame. The gases are completely burnt, leaving little soot, and with the addition of the screen 14 practically no dirt or foreign substances are projected onto the glass sheet to mar the fire-polished surface thereof.

Claims:

1. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, and a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings.

2. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, and a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, and air inlet openings in one side wall of the chamber.

3. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, and air inlet openings in one side wall of the chamber, and an adjustable valve plate over the air inlets.

4. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, and a screen in the chamber.

5. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, and air inlet openings in one side wall of the chamber, an adjustable valve plate over the air inlets, and a screen in the chamber.

6. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, and a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, the edges of the slot being formed of heat-resisting material.

7. In a sheet glass forming apparatus, a reheating burner comprising a gas pipe having a longitudinal series of openings in one side, and a mixing chamber covering the openings and having a narrow slot in its outer portion opposite the series of openings, the edges of the slot being formed of porcelain.

Signed at Toledo, in the county of Lucas and State of Ohio, this 19th day of February, 1924.

JOSEPH A. REECE.