

H. F. CLARK.
MANUFACTURE OF SHEET GLASS.
APPLICATION FILED AUG. 5, 1919. RENEWED DEC. 26, 1921.

1,424,155.

Patented Aug. 1, 1922.

Fig. 1.

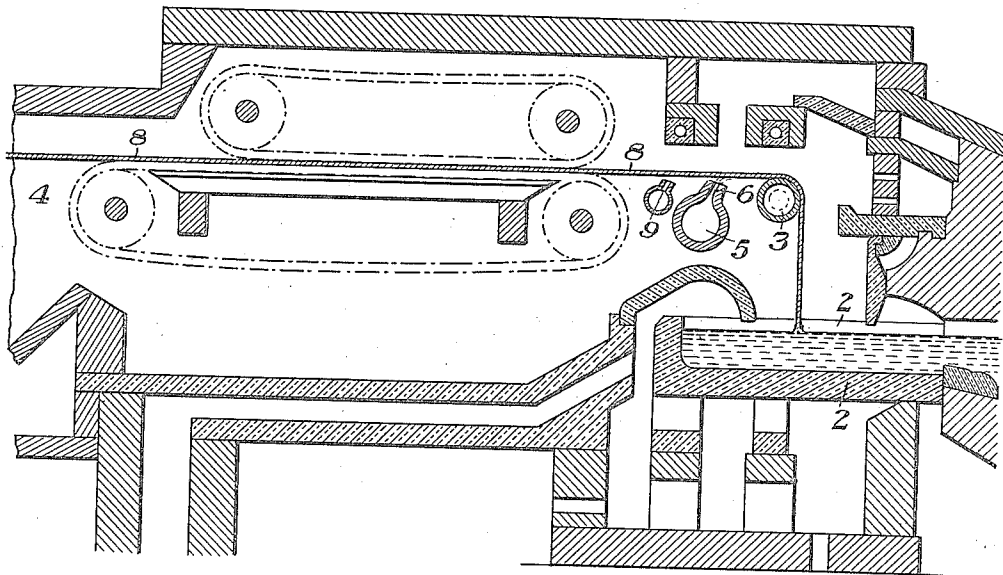


Fig. 2.

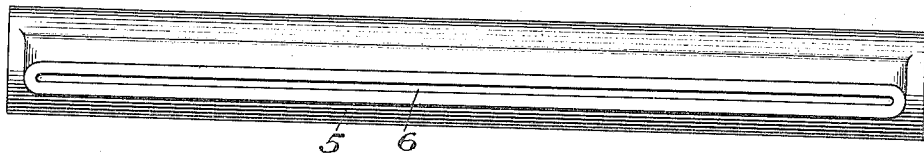
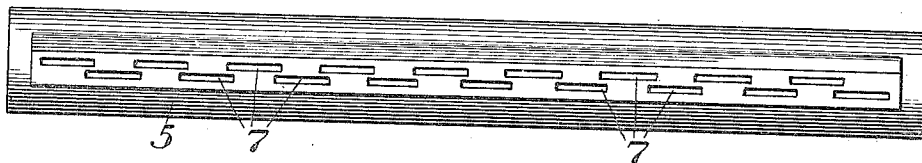


Fig. 3.



Witness

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UNITED STATES PATENT OFFICE.

HENRY F. CLARK, OF BELLE VERNON, PENNSYLVANIA, ASSIGNOR TO WINDOW GLASS MACHINE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

MANUFACTURE OF SHEET GLASS.

1,424,155.

Specification of Letters Patent.

Patented Aug. 1, 1922.

Application filed August 5, 1919, Serial No. 315,426. Renewed December 26, 1921. Serial No. 524,814.

To all whom it may concern:

Be it known that I, HENRY F. CLARK, a citizen of the United States, residing at Belle Vernon, in the county of Fayette and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Sheet Glass, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of a portion of a glass drawing apparatus, partly conventional.

Figure 2 is a plan view of the hot air distributor, and

Figure 3 is a plan view of a modified form of hot air distributor.

My invention has relation to the manufacture of sheet glass, and more particularly to that method of manufacture known as sheet drawing in which the glass, instead of being drawn in cylinder form and subsequently split and flattened into sheets, is initially drawn in sheet form.

In such method, one of the difficulties which has been encountered and which has made it difficult to produce commercial glass of the higher grades, in quantities, is the "pimpled" or roll-marked character of the surface of the glass when it contacts with the roll or rolls used in the drawing apparatus. My invention is designed to overcome this difficulty and to enable the production of sheet glass which is largely if not wholly free from objectionable "pimpling" and which will equal in quality the glass made by cylinder drawing methods.

Herein, I have illustrated my invention as applied to that form of sheet drawing in which the continuous sheet is first drawn from the glass bath in a vertical direction and is then bent horizontally over a bending roller and carried through an annealing chamber or lehr; but it will be understood that it may be equally used in connection with other methods of sheet drawing in which the difficulty above noted is encountered. Also that various changes may be made in the form and arrangement of the apparatus employed, without departing from the spirit and scope of my invention as defined in the claims.

In the accompanying drawing, the numeral 2 designates a portion of any usual receptacle containing the glass bath from

which the sheets are to be drawn, and 3 a bending roller over which the vertically rising sheet is bent in a horizontal direction and is carried by suitable gripping apparatus into an annealing chamber 4. Drawing apparatus of the character here partially and conventionally illustrated forms in itself no part of my present invention, and as it is well known in the art, need not herein be more specifically illustrated and described.

In accordance with my invention, I provide means for heating and softening the under surface of the glass sheet immediately after such surface passes out of contact with the bending roll, and at a time when the temperature of the sheet is below that of plasticity. The action of such means is substantially a "fire-flashing" which is sufficient to fuse, or partially fuse, the immediate surface of the sheet to an extent which will obliterate the objectionable pimpling of such surface. This fire-flashing can be accomplished either by air preheated to the necessary temperature and directed against the surface of the glass or by gas or oil fumes directed against such surface. In the drawing I have illustrated a distributor 5 for preheated air or gas. This is placed transversely of the glass sheet at its underside and is formed either with a continuous jet opening 6, or a plurality of staggered jet openings 7 (see Fig. 3) through which the heated fluid is directed into contact with the under surface of the glass sheet 8. Shortly back of the flashing jet, I may employ a cooling jet 9 to solidify the softened surface, when found necessary.

My invention provides simple and effective method and means capable of being applied to and used in connection with existing drawing apparatus at a relatively small cost, whereby the quality of the drawn glass can be greatly improved. The action of the flashing jet, by softening the surface portion only of the glass, removes the marks or pimples caused by the rolls and gives the surface a good polish. My invention may be used in connection with other known means for minimizing the difficulty above referred to.

I claim:

1. The method of drawing glass sheets, consisting in drawing a sheet upwardly in a generally vertical direction, bending it

over a bending device and moving it in a generally horizontal direction, and subjecting the lower surface of the sheet after it passes the bending device to the action of a heated jet, substantially as described.

2. The method of drawing glass sheets, consisting in drawing a continuous sheet upwardly from a molten glass bath, bending it over a bending device and moving it in a generally horizontal direction, and subjecting the under surface in its horizontally extending portion to the action of a heated jet followed by that of a cooling jet, substantially as described.

3. In the drawing of glass sheets, the improvement which consists in drawing a continuous sheet over the surface of a roll, and immediately thereafter subjecting the roll-contacting surface of the sheet to the action of a heated jet, substantially as described.

4. In the drawing of glass sheets, the improvement which consists in drawing a continuous sheet over the surface of a roll, and immediately thereafter subjecting the roll-contacting surface of the sheet to the action of a heated jet followed by that of a cooling jet, substantially as described.

5. The method of drawing glass sheets, consisting in drawing a continuous sheet upwardly from a molten glass bath, bending it over a bending device and moving it in a generally horizontal direction, fire flashing

the under-surface of the sheet immediately after it passes the bending device, and then applying a cooling jet to its under surface, substantially as described.

6. In the drawing of glass sheets, the improvement which consists in drawing a continuous sheet vertically from a glass bath, bending the sheet over a roll onto a horizontal path, and causing the roll-contacted surface of the sheet to then pass in contact with a fire-flashing jet and then in contact with a cooling jet, substantially as described.

7. In apparatus for drawing glass sheets from a molten bath, a bending device, means for drawing a continuous sheet upwardly in a vertical direction and thence over a bending device in a generally horizontal direction, and means for fire flashing the under side of the sheet after it passes the bending device, substantially as described.

8. In apparatus for drawing glass sheets from a molten bath, a bending device, means for drawing a continuous sheet upwardly in a vertical direction and thence over a bending device in a generally horizontal direction, means for fire flashing the under side of the sheet after it passes the bending device, and means for cooling the fire flash surface, substantially as described.

In testimony whereof, I have hereunto set my hand.

HENRY F. CLARK.