Sept. 27, 1932. B. LONG 1,879,698

PROCESS AND APPARATUS FOR TEMPERING GLASS

Filed July 30, 1930

Fig. 1

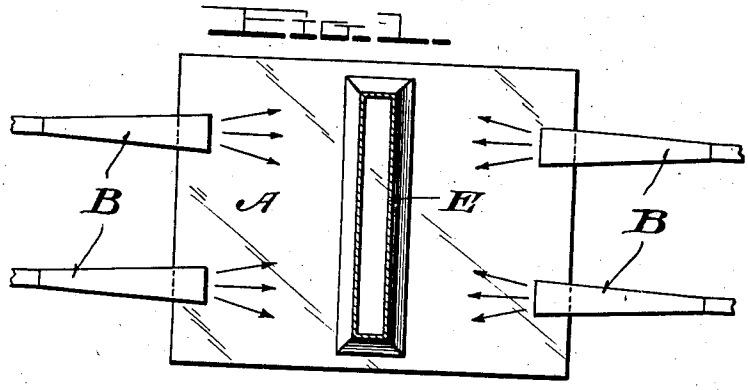


Fig. 2

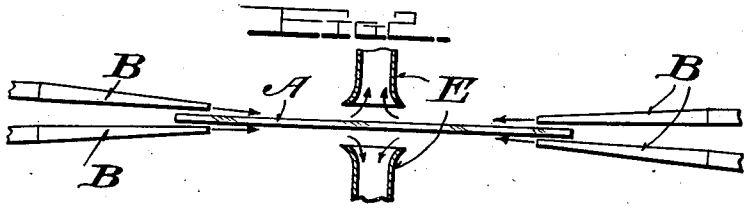


Fig. 3

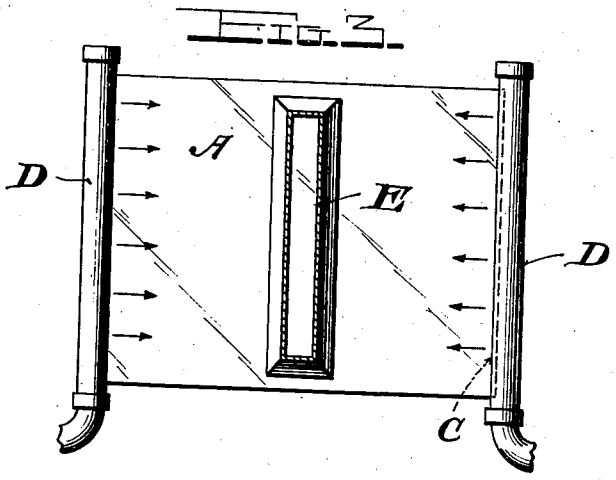
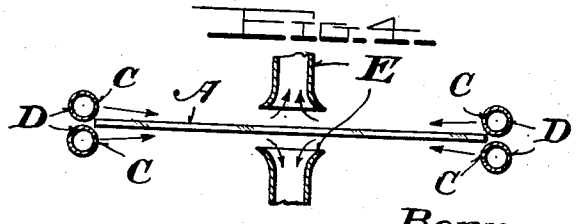


Fig. 4



Inventor

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Attorneys

Patented Sept. 27, 1932

1,879,698

UNITED STATES PATENT OFFICE

BERNARD LONG, OF PARIS, FRANCE, ASSIGNOR TO SOCIETE ANONYME DES MANUFACTURES DES GLACES & PRODUITS CHIMIQUES DE SAINT GOBAIN, CHAUNY & CIREY, OF PARIS, FRANCE

PROCESS AND APPARATUS FOR TEMPERING GLASS

Application filed July 30, 1930, Serial No. 471,791, and in France August 7, 1929.

It has heretofore been proposed to temper glass articles by directing blasts of air thereon while highly heated, these blasts having generally been directed on the glass in a direction normal to its surface. Under such circumstances it has been necessary to maintain the blast nozzles at some distance from the surface, and in order to obtain a sufficient rate of circulation of the air over the surface to effect the rapid cooling desired, it has been further necessary to use high velocity jets which tend to deform the soft glass.

I propose to overcome these and other defects in the prior art practices by directing the jets at an angle to the surface to be tempered, whereby the nozzles can be brought into close proximity to the surface, and whereby high velocity jets can be employed, due to the low angle of incidence of the jets. Furthermore, the inclined jets provide for a better circulation of air across the surface. To aid in accomplishing this circulation, I further provide means for drawing away from the neighborhood of the plate, air after its passage thereover. For the purposes stated, my invention therefore comprises the construction, arrangement, and combination of the various parts of which it is composed, as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawing in which corresponding parts are designated by corresponding marks of reference,

Figure 1 is a front view, and Figure 2 is a section of one form of apparatus embodied in my invention;

Figure 3 is a front view, and Figure 4 is a section through a modification thereof.

A is a sheet of glass, preferably supported vertical. B represents in Figures 1 and 2, elongated blast nozzles, the ends of which are located in proximity to the two vertical edges of the sheet, with the major axes of the ends opening parallel with the sheet. The nozzles are so directed that they make an acute angle to the plane of the sheet, so that the jets therefrom are directed on the sheet near the edges thereof, and sweep over the face of the sheet towards the medial vertical line thereof. In order to avoid the unequal cooling which might result from the cross-currents which would be created at the center of the plate, I provide at that point an eduction nozzle E, connected with a suitable exhaust apparatus. This consists of a vertically elongated mouth terminating near the medial line of the plate.

In Figures 3 and 4, a form of my invention is shown in which, in lieu of the several nozzles B, along an edge of the sheet, a nozzle in the form of pipe D slotted lengthwise, as at C, is employed to direct jets in the direction and manner before described.

As shown, I prefer to place the nozzles on opposite sides of the sheets to be tempered. By preference, the preliminary operation to a temperature corresponding to that of the commencement of the softening of the glass which, for ordinary window glass will be in the neighborhood of 550° to 620° C. and is subjected to the air jets before its natural cooling destroys the uniformity of such heat.

Having thus described my invention what I claim is:—

1. The hereinbefore described method of tempering a glass sheet which comprises heating the sheet to a proper temperature directing jets of cool air on the surface thereof at an acute angle therewith and towards the center of the sheet, and drawing air from adjacent such center.

2. In an apparatus of the character described for the tempering of glass sheets, an air blast nozzle adjacent to and inclined at an acute angle to the plane of the surface of the sheet, in combination with an eduction nozzle terminating adjacent to the plane of the surface of the sheet along the path of the air from the blast nozzle.

3. In an apparatus of the character described, for tempering glass sheets, the combination with oppositely directed air blast nozzles adjacent to and inclined at an acute angle to the plane of the surface of the sheet, and an eduction nozzle terminating adjacent to the plane of the sheet between the oppositely directed blast nozzles.

4. The hereinbefore described method of tempering a glass sheet which comprises heating the sheet to a proper temperature and

directing cool air against the surface thereof at an angle thereto and creating a vacuum adjacent to the surface of the sheet at a point remote from that at which the air is directed on the sheet.

5. In an apparatus of the character described for tempering glass sheets, an air blast nozzle adjacent to and inclined at an acute angle to the plane of the surface of the sheet in combination with a vacuum nozzle adjacent to the surface of the sheet at a point remote from that at which the air from the blast nozzle strikes the sheet and in the path of the air from the blast nozzle.

In testimony whereof I hereunto affix my signature.

BERNARD LONG.