

No. 653,238.

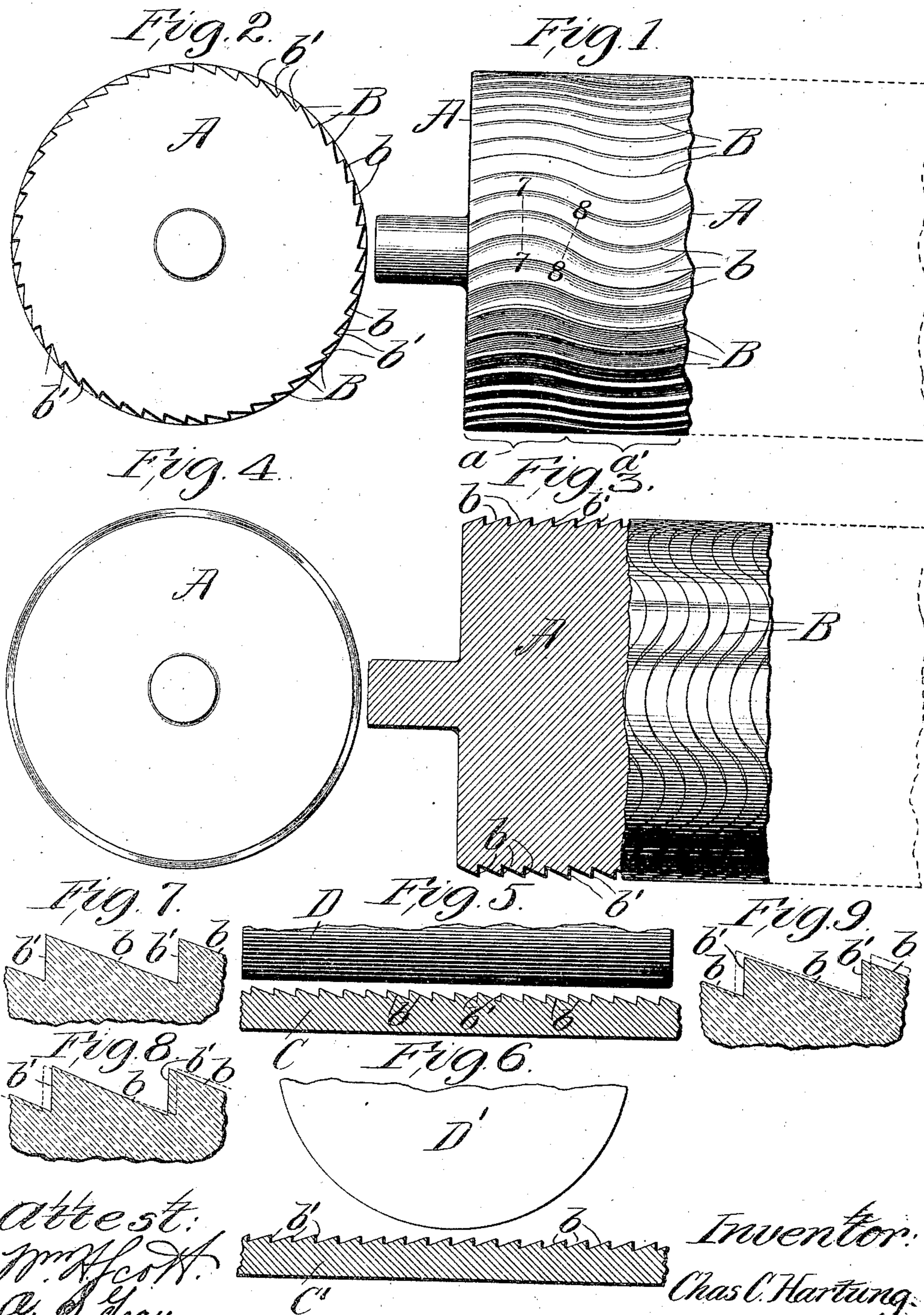
Patented July 10, 1900.

C. C. HARTUNG.

MEANS FOR FORMING SHEET GLASS OF THE PRISMATIC TYPE.

(No Model.)

(Application filed Sept. 25, 1899.)



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# UNITED STATES PATENT OFFICE.

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## MEANS FOR FORMING SHEET-GLASS OF THE PRISMATIC TYPE.

SPECIFICATION forming part of Letters Patent No. 653,238, dated July 10, 1900.

Application filed September 25, 1899. Serial No. 731,608. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES C. HARTUNG, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have  
5 invented a certain new and useful Improvement in Means for Forming Sheet-Glass of the Prismatic Type, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same.

This invention relates to a new and useful improvement in means for forming sheet-glass of the prismatic type—such, for instance, as  
15 that illustrated in my application for prismatic rolled sheet-glass executed by me of even date herewith.

The object of my invention is to provide means for impressing during the process of rolling one or both faces of molten glass with a  
20 particular configuration.

The essential features of my present invention are to provide upon one or the other or both of the two essential elements—namely, the molding-table bed and the roll—a series  
25 of raised angular-inclined projections, which projections are eccentric, said inclined projections being arranged in compound curves or in serpentine design.

Other features of my invention reside in  
30 the novel construction, arrangement, and combination of these several parts of my device, all as will hereinafter be described and afterward pointed out in the claims.

I attain the objects heretofore referred to  
35 by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a detail side elevational view of one end of a roll employed in carrying out my invention. Fig. 2 is an end elevational  
40 view of the same. Fig. 3 is a detail side elevational view, partly in section, of a slightly-modified form of roll employed in carrying out my invention. Fig. 4 is an end elevational view of the same. Fig. 5 is a detail  
45 view of the lower side of a roll, together with a sectional view of a portion of a bed, which, collectively, illustrate a slightly-modified form of means for carrying out my invention. Fig. 6 is an end view of the lower portion of  
50 a roll, together with a sectional view of a portion of a bed, which, collectively, illus-

trate still another slightly-modified means for carrying out my invention. Fig. 7 is an enlarged sectional view on line 7 7, Fig. 1. Fig. 8 is an enlarged sectional view on line 8 8, 55 Fig. 1, showing the shoulders of the same height and a change in the angle of the inclined faces; and Fig. 9 is a similar view showing the shoulders of different heights, resulting from maintaining a given angle through-  
60 out the inclined faces.

In the drawings, A indicates a roll, on the periphery of which is arranged a series of ratchet-like ribs or projections B, said ribs being shown as having inclined faces *b* and  
65 straight shoulders *b'* therebetween. It will be understood, however, that this special form of rib may be changed—that is, the straight or transverse shoulders may be dispensed with and made inclined instead—and, fur-  
70 ther, that instead of the rib terminating in an apex a flat portion may be left at the surface, when the structure might then be more properly described as having grooves instead of projections. Ribs B, as shown in Fig. 1, 75 are arranged longitudinally and in curvilinear form on the periphery of the roll, the curved lines thereof being eccentric with each other. The curved lines embraced within the bracket  
80 *a* are all described from centers with the same radii, while those comprehended within bracket *a'* are likewise described from centers and of the same radii, which, however, may be greater or less than that employed  
85 with relation to the curves embraced by the bracket *a*. In fact, changes in design may be made as desired.

Two curved lines with the same radii, but described from different centers, if not too far apart, will form a crescent if continued a  
90 sufficient distance. I make this statement merely to illustrate the fact that curved lines having the same radii, and sometimes with different radii, if struck from different centers, will not at any point be parallel to each  
95 other, and I take advantage of this in the formation of my means for forming prismatic glass in order that the glass thus produced will accomplish a greater diffusion of trans-  
100 mitted rays of light.

In Figs. 3 and 4 of the drawings I have illustrated the curvilinear ribs B circumfer-

entially disposed on the roll, but in other respects these ribs are practically the same as the ribs illustrated in Fig. 1.

In Fig. 7 I have shown an enlarged sectional view through a point in the roll, as indicated at 7 7, Fig. 1, where the apexes of two ribs are most widely separated from each other, while in Fig. 8, as indicated at 8 8, Fig. 1, I have shown an enlarged sectional view through a point on the roll where the apexes of two ribs most nearly approach each other. Assuming that the straight faces  $b'$  are the same height throughout, it follows that if the angle of the inclined face on said line 7 7 is of any given degree—say fifteen degrees when said straight faces are placed at the same height nearer together—a line drawn from the top of one to the bottom of the other will produce a greater inclination or an increased angularity, depending upon the amount of such approach. A roll made with its straight faces  $b'$  in curved lines substantially as shown in Fig. 1 will, if said shoulders are the same height throughout, produce a difference in the inclination of the faces between said shoulders, the angle of such inclination gradually increasing from a point where said two shoulders most nearly approach each other, resulting by such change in inclination in producing wavy lines in the inclined faces, the crowns of which are approximately at points between the nearest approach of any two vertical faces or shoulders to each other. On the other hand, assuming that the degree of inclination of all the faces  $b$  is maintained throughout, the result of this will be the production of a wavy line along the apex of each rib—that is, the straight faces  $b'$  will be highest where the distance is greatest between any two shoulders, and the height of said straight faces will be less at any point where two of said shoulders most nearly approach each other.

While I have referred in the above to the inclined faces  $b$  and the straight faces  $b'$  as being formed on a roll, it is obvious that they might as well be formed on the bed of a molding-table, as is illustrated by the reference-letters C and C' in Figs. 5 and 6, respectively, and when such a construction is employed I need only make use of a plain cylindrical roll which is lettered D in Fig. 5 and D' in Fig. 6, which rolls D or D' are then only utilized to roll the molten glass into sheet form.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my machine can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the character described,

the combination with one of the elements between which molten glass is rolled into sheet form, of a series of inclined faces arranged in compound curves or serpentine design, which compound curves or serpentine faces are eccentric with each other, substantially as described.

2. In a device of the character described, the combination with one of the elements between which molten glass is rolled into sheet form, of inclined faces of ratchet-tooth shape, said inclined faces being arranged in a compound curve or serpentine design and eccentric with each other, substantially as described.

3. In a device of the character described, the combination with one of the elements between which molten glass is rolled into sheet form, of inclined faces, the lines of which are described from different centers, but with the same radii, substantially as described.

4. In a device of the character described, the combination with one of the elements between which molten glass is rolled into sheet form, of straight faces and inclined faces arranged in serpentine form and eccentric with each other, the degree of inclination varying from a point where said shoulders are most widely separated to a point where said shoulders most nearly approach each other, substantially as described.

5. In a device of the character described, the combination with one or the other of the two elements between which molten glass is rolled into sheet form, a plurality of serpentine ribs or projections on the face, of one of said elements which are eccentric with each other, at least one of the faces of said ribs being inclined, the height of said ribs varying from a point where the ribs are most widely separated to a point where they most nearly approach each other, substantially as described.

6. In a device of the character described, the combination with one or the other of the two elements between which molten glass is rolled into sheet form, a plurality of serpentine ribs or projections on the face of one of said elements which are eccentric with each other, at least one of the faces of said ribs being inclined, the height of said ribs varying from a point where the ribs are most widely separated to a point where they most nearly approach each other, whereby, when a mass of molten glass is rolled into sheet form by said elements, a plurality of serpentine, eccentric, grooves are impressed thereinto; substantially as and for the purpose specified.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 13th day of September, 1899.

CHARLES C. HARTUNG.

Witnesses:

WM. H. SCOTT,  
F. R. CORNWALL.