No. 713,758. Patented Nov. 18, 1902.

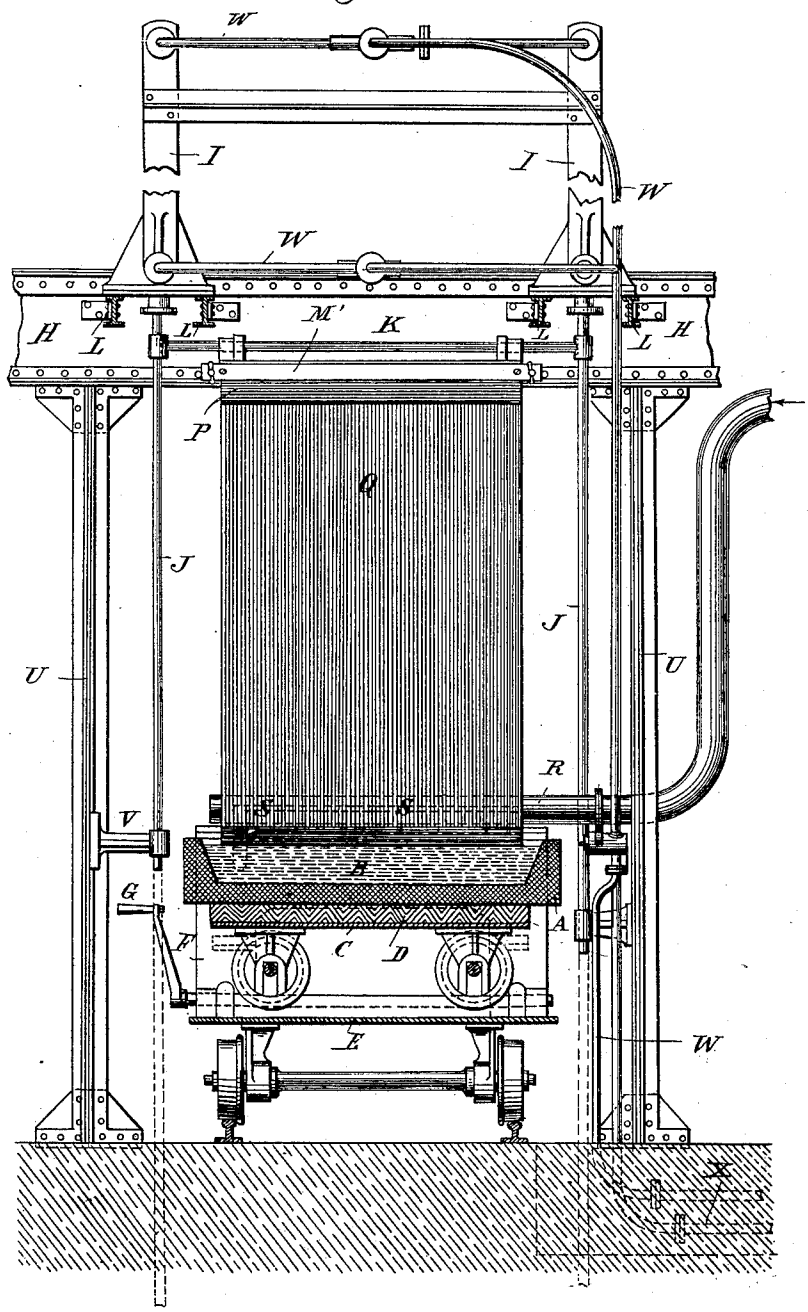
F. GIUANNOTTE.

HYDRAULIC APPARATUS FOR THE MANUFACTURE OF WINDOW GLASS.

(Application filed May 26, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(Application filed May 26, 1902.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

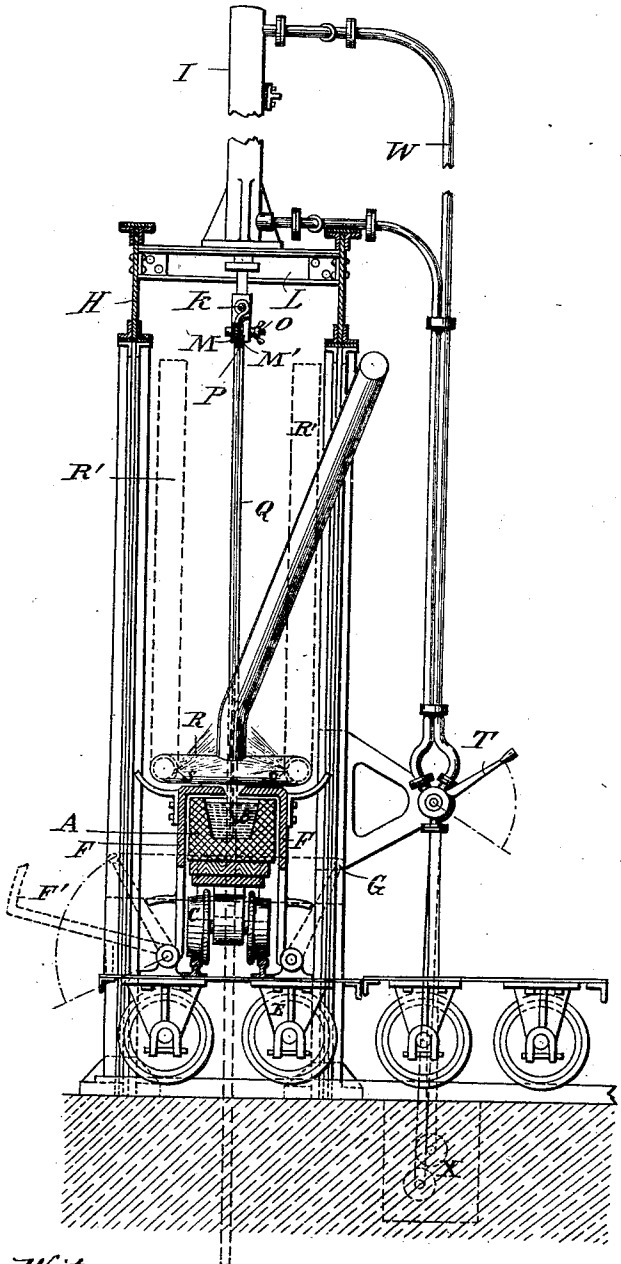
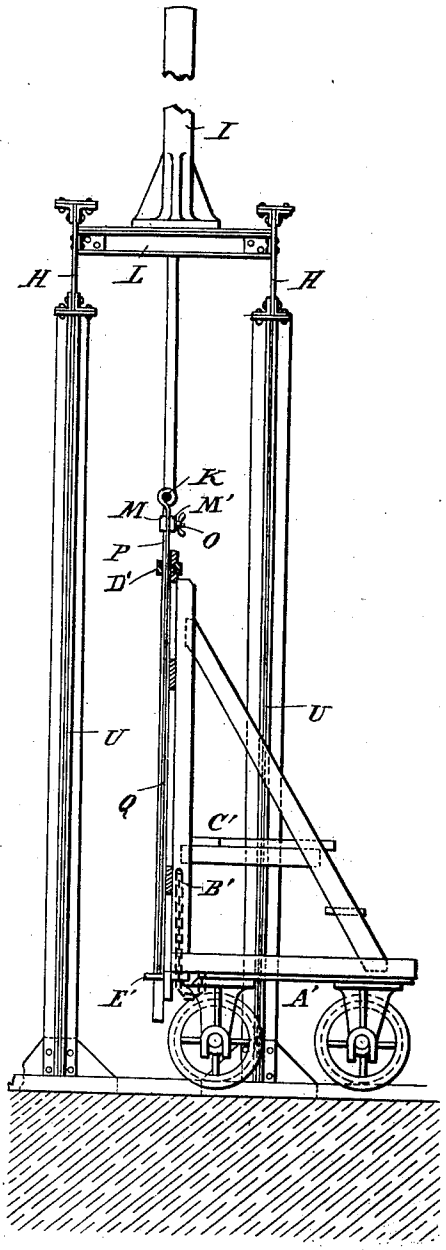


Fig. 4.



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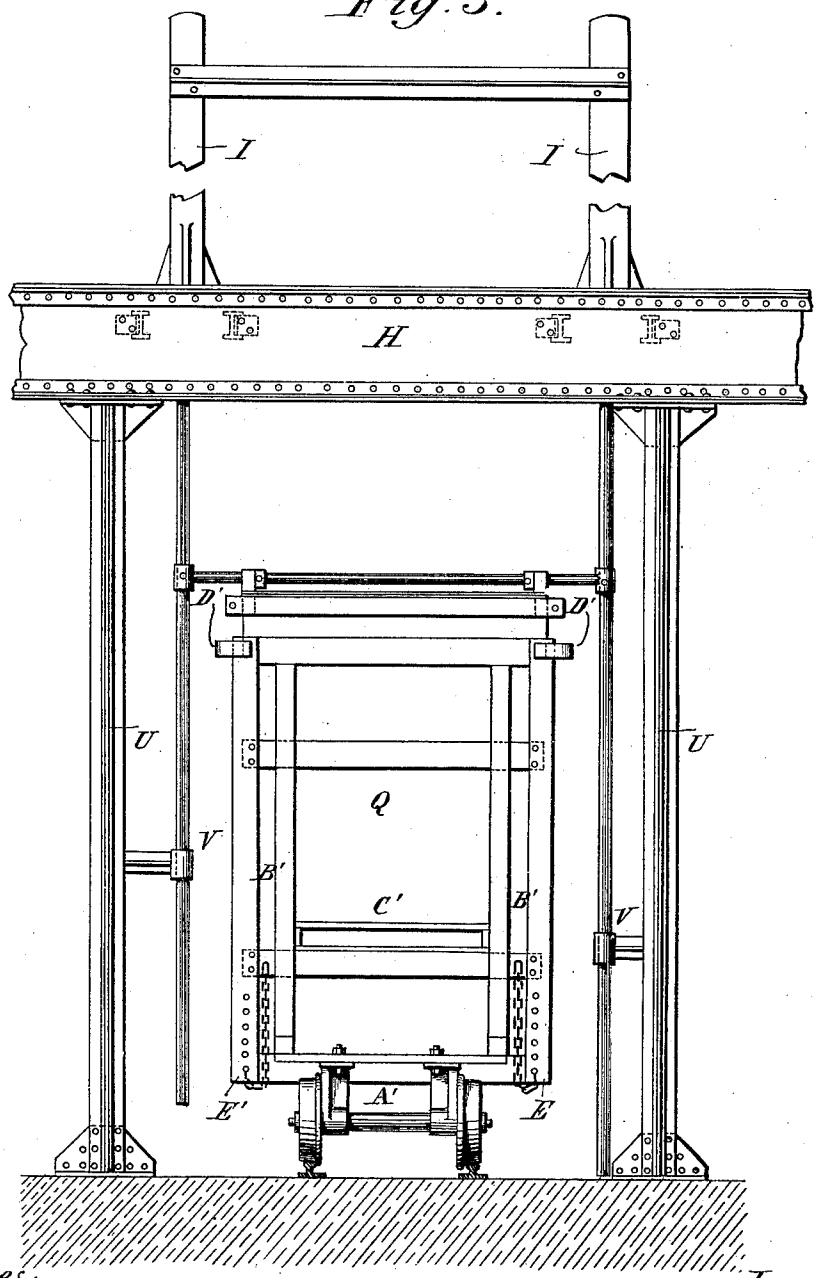
F. GIUANNOTTE.

HYDRAULIC APPARATUS FOR THE MANUFACTURE OF WINDOW GLASS.

(Application filed May 26, 1902.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCOIS GIUANNOTTE, OF CHARLEROI, BELGIUM.

HYDRAULIC APPARATUS FOR THE MANUFACTURE OF WINDOW-GLASS.

SPECIFICATION forming part of Letters Patent No. 713,758, dated November 18, 1902.

Application filed May 26, 1902. Serial No. 109,015. (No model.)

To all whom it may concern:

Be it known that I, FRANCOIS GIUANNOTTE, a subject of the King of Belgium, and a resident of Charleroi, Belgium, have invented an Improved Hydraulic Apparatus for the Manufacture of Window-Glass, of which the following is a specification.

This invention relates to an improved hydraulic apparatus for manufacturing window-glass in a mechanical manner.

The annexed drawings, to which reference will be made in the following specification, illustrate a form of construction of my improved hydraulic apparatus by way of an example.

Figure 1 is a front elevation, partly in section; Fig. 2, a vertical cross-section; Fig. 3, an elevation showing the opposite end to that of Fig. 1; and Fig. 4 a side elevation thereof, corresponding to Fig. 3.

The apparatus comprises two inverted vertical hydraulic cylinders I, mounted upon a convenient elevated supporting-frame H L at such a height above the ground as to afford easy working and ready passage beneath the apparatus. The piston-rods J of said cylinders are connected together at a certain distance by a cylindrical traverse K, from which is suspended a flat bar M by means of eyepieces, as shown in Figs. 1 and 2. The said bar is faced with asbestos-board and carries at each end a screw O, having elongated or high pitch. A second bar M′ is also faced with asbestos and suspended from the cylindrical traverse and provided with corresponding holes for the reception of the screws O of the bar M. In the space comprised between the two bars M and M′ is a strip P, of glass, of a specified width and thickness and of a length limited by the screws O. This strip is slightly curved at its upper portion, and when pressed between the asbestos-boards by means of the flat bars M M′ and winged nuts engaged upon the aforementioned screws it can readily expand or contract and at the same time support the sheet of glass which it has to develop. The rods J of the hydraulic pistons are guided near their lower ends in guides V, connected with brackets fixed to standards or columns U for the purpose of insuring perfect rectilinear motion to said rods.

A trough or receiver A of refractory material, having an elongated rectangular form, is charged with a sufficient quantity of molten glass B for the production of several sheets of glass. This trough is carried upon a carriage C, furnished with insulating material D between the body thereof, and is introduced into a reheating-furnace for the purpose of imparting to the glass the required temperature for forming the sheets. When the said trough is removed from the furnace, the carriage C is received upon a truck E and is then run under the hydraulic apparatus and placed exactly in the axial line of the cylinders I. The truck E is provided with two hinged gage-plates F, with angular upper ends, and arranged to be moved by means of levers G. When said angular gage-plates are standing upright, as shown in full lines at Fig. 2, they leave between their adjacent edges a narrow opening close to the upper end of the trough A, which opening serves for the passage of the glass P, so as to fuse it onto the molten glass in the trough and withdraw it from the latter. By this arrangement the required temperature of the glass can be readily maintained, while the trough is prevented from cooling too quickly and cracking, and facility is afforded to the operators to approach the apparatus.

The dotted lines F′ show one of the hinged gage-plates turned sidewise in its inoperative position.

When the trough has been properly placed beneath the hydraulic cylinders, the operator brings down on each side of the slot formed between the gage-plates two pipes R for the delivery of fresh air supplied by a fan through longitudinal slots S of the tubes. A hydraulic three-way cock, operated by a lever T, supplies water under pressure from a pipe W in connection with any suitable source. The water can be delivered above and beneath the pistons in the hydraulic cylinders, said pistons being capable of being stopped at any point of their stroke. X is the discharge-pipe for the water. The operator opens the three-way cock by means of its lever T, so as to lower the starting blade or strip P into the trough and bring it near the molten glass, where it becomes then heated. After the blade has acquired sufficient heat it is lowered into the

molten glass and soon begins to form body therewith. At this moment the operator opens the air-valve and also starts the hydraulic pistons to move upward. The molten glass adhering to the strip P forms a sheet which cools as it issues from the trough, and in thus solidifying it can be gradually lifted to a height according to any particular length of sheet or glass. By more or less accelerating the upward movement the sheet of glass will be more or less thick. So soon as the sheet of glass has attained the required length the operator cuts it close to the gage-plates F by means of an iron blade, wire, or the like and then raises the air-pipe, as indicated by the dotted lines, (see Fig. 2,) when the air may be shut off. Thereupon the trough is withdrawn and reintroduced into the furnace, if necessary, and the suspended sheet of glass Q is then received in a frame. Said frame is mounted on truck A′ and is made entirely of wood, fitted at the upper end with two spring-clips D′, designed to firmly hold the sheet of glass between asbestos linings or pads and the uprights B′. At the lower end of these latter are provided holes for the reception of wooden pegs or screws E′ for carrying the glass if the latter is not sufficiently retained in the clips. The operator while standing on a platform C′, provided on the frame, takes off the winged nuts of the clamping-bar M′ and disengages the latter from the sheet Q. The manufactured sheet is then taken to a room for the purpose of cutting off the strip P, which may serve again for a fresh operation.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for the manufacture of window-glass in sheets, the combination with hydraulic lifting-cylinders mounted upon an elevated framework, of a traverse connected to the piston-rods thereof, a clamping-bar suspended from said traverse and faced with asbestos and connected with a similar asbestos-faced clamping-bar, a glass strip curved at its upper part and clamped between said suspended clamping-bars and a trough holding molten glass, to and from which the strip may be moved.

2. In an apparatus for making sheet-glass, the combination with hydraulic cylinders mounted upon an elevated frame, of a traverse connected to the piston-rods thereof, clamping-bars suspended from said traverse, a glass strip clamped between said bars and curved at its upper part, a trough charged with molten glass, a carriage carrying said trough, a truck supporting said carriage, two plates hinged to the truck and forming a slot over the trough, and two removable air-tubes at the sides of the slot formed by the said plates.

3. In an apparatus for making window-glass, the combination with two hydraulic cylinders mounted upon an elevated framework, a traverse connected to the piston-rods thereof, a bar suspended from said traverse and faced with asbestos and connected with a similar bar also faced with asbestos, a glass bait-strip and screws for clamping said bars thereon, of a wooden frame mounted on a truck, spring-clips secured to said frame, to grip the finished sheet of glass, and adjustable pegs at the lower part of said frame for supporting the glass.

4. In an apparatus for making sheet-glass, the combination with a trough holding molten glass, of a vertically-movable bait-strip clamped between bars and adapted to be moved to and from the trough to draw a sheet therefrom, hinged plates forming a slotted cover over the trough, and air-pipes above the plates to deliver a cooling-blast against both sides of the sheet as it issues from the trough.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

FRANCOIS GIUANNOTTE.

Witnesses:
O. ASHE,
GREGORY PHELAN.