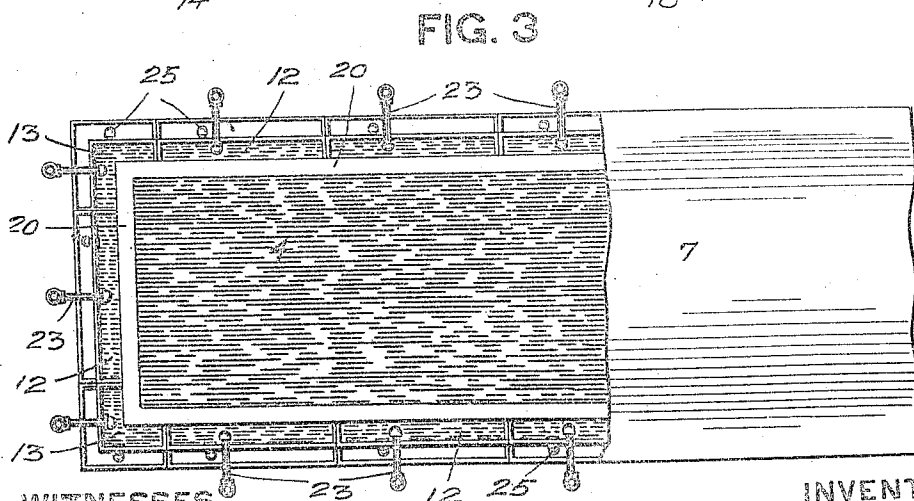
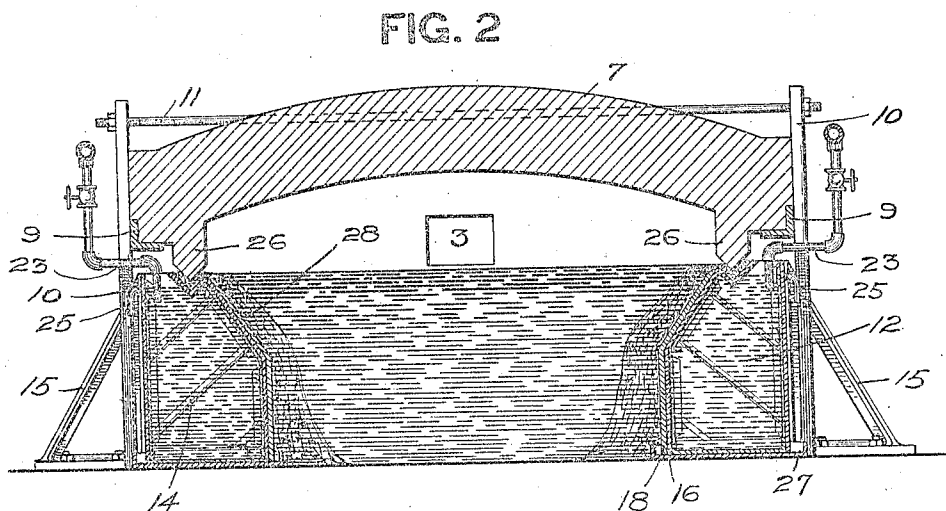
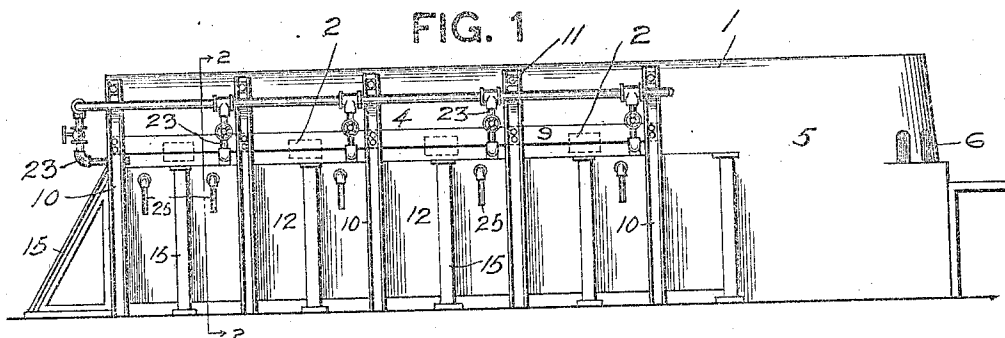


No. 792,705.

PATENTED JUNE 20, 1905.

A. O. HURLEY.
GLASS TANK FURNACE.
APPLICATION FILED OCT. 10, 1903.

2 SHEETS-SHEET 1.



WITNESSES.

J. R. Keller
Robert C. Totten

INVENTOR.

Audrie O. Hurley
By Kay Totten & Co.
attorneys

No. 792,705.

PATENTED JUNE 20, 1905.

A. O. HURLEY.

GLASS TANK FURNACE.

APPLICATION FILED OCT. 10, 1903.

2 SHEETS--SHEET 2.

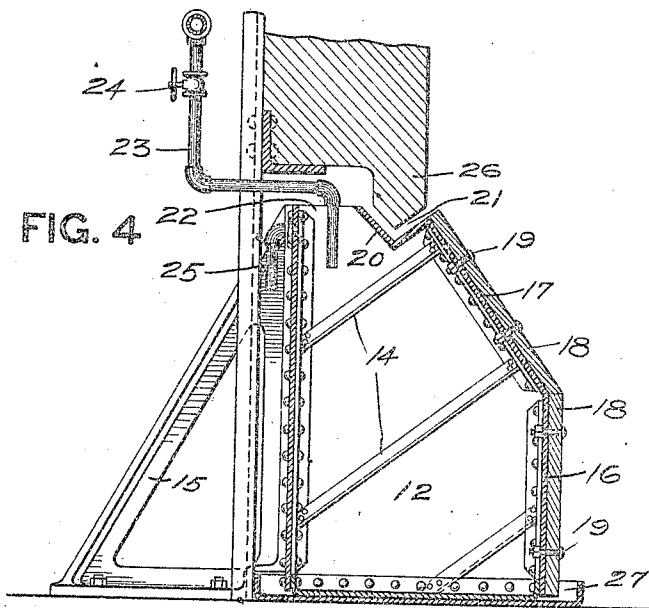
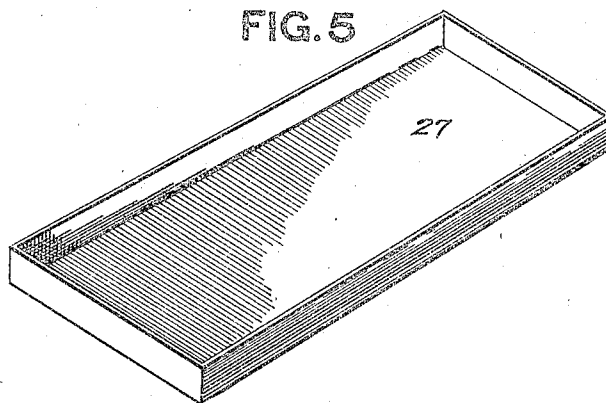


FIG. 5



WITNESSES.

J. R. Keller
Robert C. Lott

INVENTOR.

Andrew O'Hanley
Ray Latham & Winter
attorneys

UNITED STATES PATENT OFFICE.

ANDREW O. HURLEY, OF NEW BETHLEHEM, PENNSYLVANIA.

GLASS-TANK FURNACE.

SPECIFICATION forming part of Letters Patent No. 792,705, dated June 20, 1905.

Application filed October 10, 1903. Serial No. 176,502.

To all whom it may concern:

Be it known that I, ANDREW O. HURLEY, a resident of New Bethlehem, in the county of Clarion and State of Pennsylvania, have invented a new and useful Improvement in Glass-Tank Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to glass-tank furnaces. In a patent granted to me on the 17th day of January, 1899, No. 617,748, I have illustrated and described a certain improvement in glass-tank furnaces, the object of that invention being to increase the life of the furnace by protecting the walls thereof from the action of the flux in the molten glass, which is liable to attack the refractory lining and disintegrate the same.

The present invention relates to an improvement in the above invention; and it consists in the novel features hereinafter fully set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of a glass-tank embodying my invention. Fig. 2 is a cross-section on the line 2 2, Fig. 1. Fig. 3 is a plan view with a portion of the roof removed. Fig. 4 is an enlarged cross-section of the water-tank and a portion of the furnace wall and roof supported above the same, and Fig. 5 is a perspective view of one of the pans for receiving the drippings or overflow from the water-tank.

My invention may be applied to different forms of glass-tank furnaces, as the arrangement of heating-flues, &c., forms no part of this invention.

The numeral 1 represents a glass-tank furnace having the regenerators 2, (shown in dotted lines,) located along the sides of the melting-section, and having the ports 3, leading into said melting-section. These regenerators only extend along the melting-section, as it is in this section of the furnace that the high temperature is maintained for the melting operation. The furnace may be said to be divided into the melting-section 4 and the

gathering-section 5. The gathering end has the regular gathering-ports 6. The roof 7 is supported independently of the walls, said roof being arched and supported at the sides upon the shelves 9, which are carried by buck-staves 10, connected by tie-rods 11. By the above construction the walls of the furnace may be repaired without interfering with said roof.

The walls of the furnace are made up of the water-tanks 12, said tanks being arranged end to end and secured together in any suitable manner, the corners of the walls being made up of the corner-pieces 13. If desired, however, one continuous tank may be employed instead of several tanks, as illustrated. These water-tanks 12, as indicated in Fig. 4, are composed of metal plates riveted together and braced within by angle-bars 14. The exteriors of the tanks are braced by means of the braces 15, bolted to a suitable floor or foundation. The inner walls of the tank 12 have the vertical portion 16 and the inclined portion 17. To this inner wall are secured the wooden linings 18 by the bolts 19. The upper portion of the inner plate 17 is shaped, as at 20, to form the groove or depression 21, which extends along the top of the tank. The top of the tank is open, as at 22, and extending into this opening is the supply-pipe 23 for supplying water to the tank. A valve 24 controls the pipe 23. The overflow-pipe 25 is provided.

Depending from the roof 7 is the longitudinally-extending rib or extension 26, which projects into the groove 21.

Beneath the tanks 12 are the pans 27, which are adapted to receive any drippings from the tanks.

When my improved glass-furnace is in use, the batch for forming the glass is introduced into the front end of the furnace, and the furnace is then heated up to the proper temperature to melt the batch, which gradually resolves itself into a molten mass. As the temperature increases the glass becomes thinner and flows toward the gathering end. The glass adjacent to the side walls or water-tanks will become chilled by the action of the water and a layer of chilled glass will be formed along the sides of the furnace, as indicated in

an exaggerated form at 28, Fig. 2. The wooden lining 18 may become burned or charred by the heat of the furnace; but the effect of the cooling fluid will be to cause the chilling of the glass, as stated, along the sides of the tank. 5 The molten glass will enter the grooves 21 and will become chilled by contact with the metal, as indicated in Fig. 2. This portion of the chilled glass within the groove 21 will 10 act to bind or lock the layer of chilled glass extending down along the sides of the tank and prevent its slipping down, as might occur in the case of vertical inner walls in the furnace. The depending projections 26, entering the grooves 21, will, in connection with 15 this chilled portion of the glass in the grooves 21, act to seal the sides of the tank and prevent the escape of the heat. By having the inner walls of the tank slightly inclined, as at 20 17, the slipping of the glass is further prevented and greater opportunity is given the glass to chill and form the protecting-covering for the walls. The consequence is that 25 the hot molten glass does not have an opportunity to reach the walls of the furnace, but is held within a receptacle, as it were, of chilled glass, as there is generally a layer of semi-fluid or partially-solid glass on the bottom of these furnaces, due to the chilling action of 30 the bottom. This wall of chilled glass would not be hot enough to affect the iron plates, and, furthermore, said plates have a circulat-

ing stream of water constantly in contact therewith, which keeps them cool.

What I claim is—

1. A glass-tank furnace having walls with their interior faces extending up vertically from the bottom for a distance and inclining outwardly from that point, and a groove or depression formed in said walls beyond said 35 inclined portion adapted to receive the molten glass. 40

2. A glass-tank furnace having walls provided with a groove or depression extending longitudinally thereof along the upper edge 45 of said walls adapted to receive the molten glass, means for chilling the glass in said groove, a roof supported independently of said walls, and a depending rib on said roof adapted to enter said groove. 50

3. In a glass-tank furnace, a metal tank forming the wall of the glass-melting compartment of said furnace, the inner plates of said tank extending vertically from the bottom for a distance, and inclining outwardly 55 from that point, and a groove or depression formed in said plate beyond said inclined portion adapted to receive the molten glass.

In testimony whereof I, the said ANDREW O. HURLEY, have hereunto set my hand.

ANDREW O. HURLEY.

Witnesses:

ROBERT C. TOTTEN,
G. C. RAYMOND.