

May 20, 1930.

J. MAYO

1,759,624

LEER

Filed Oct. 1, 1927

2 Sheets-Sheet 1

Fig. 1.

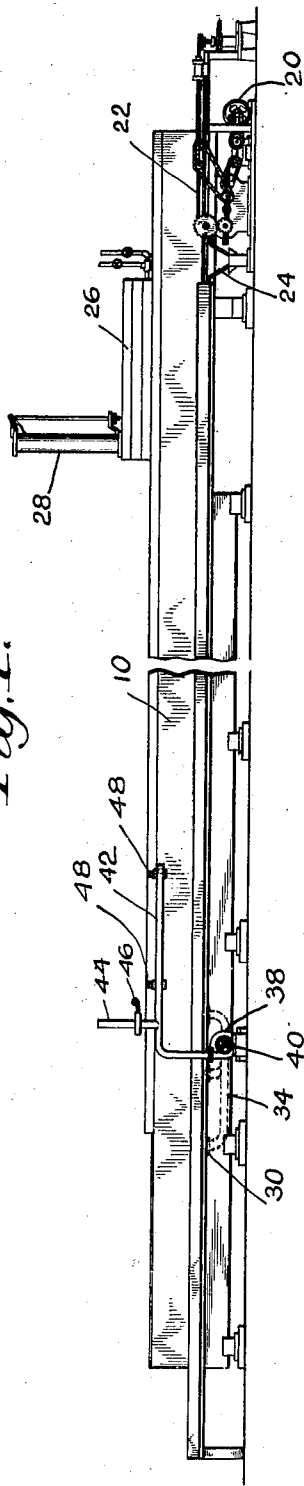
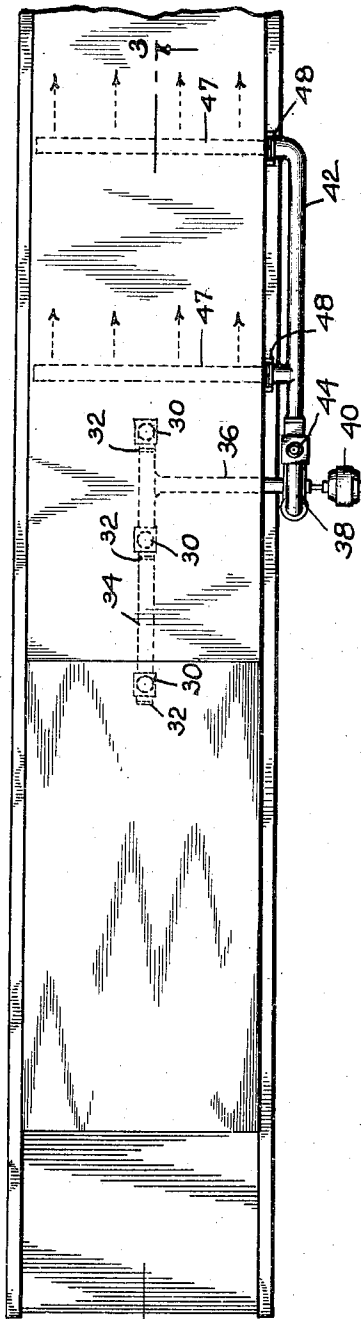


Fig. 2.



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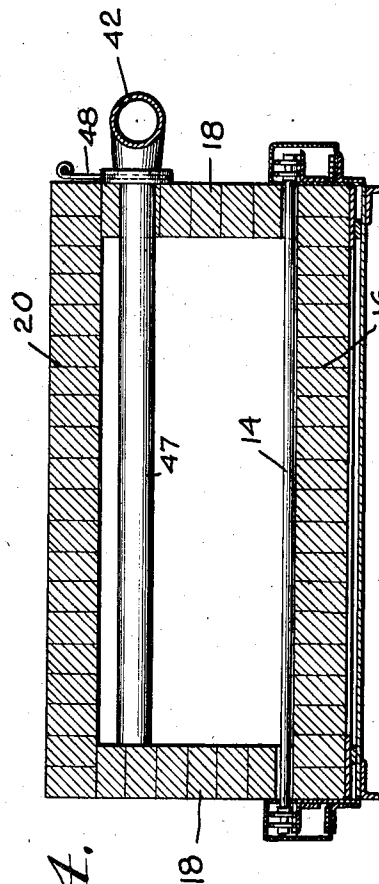
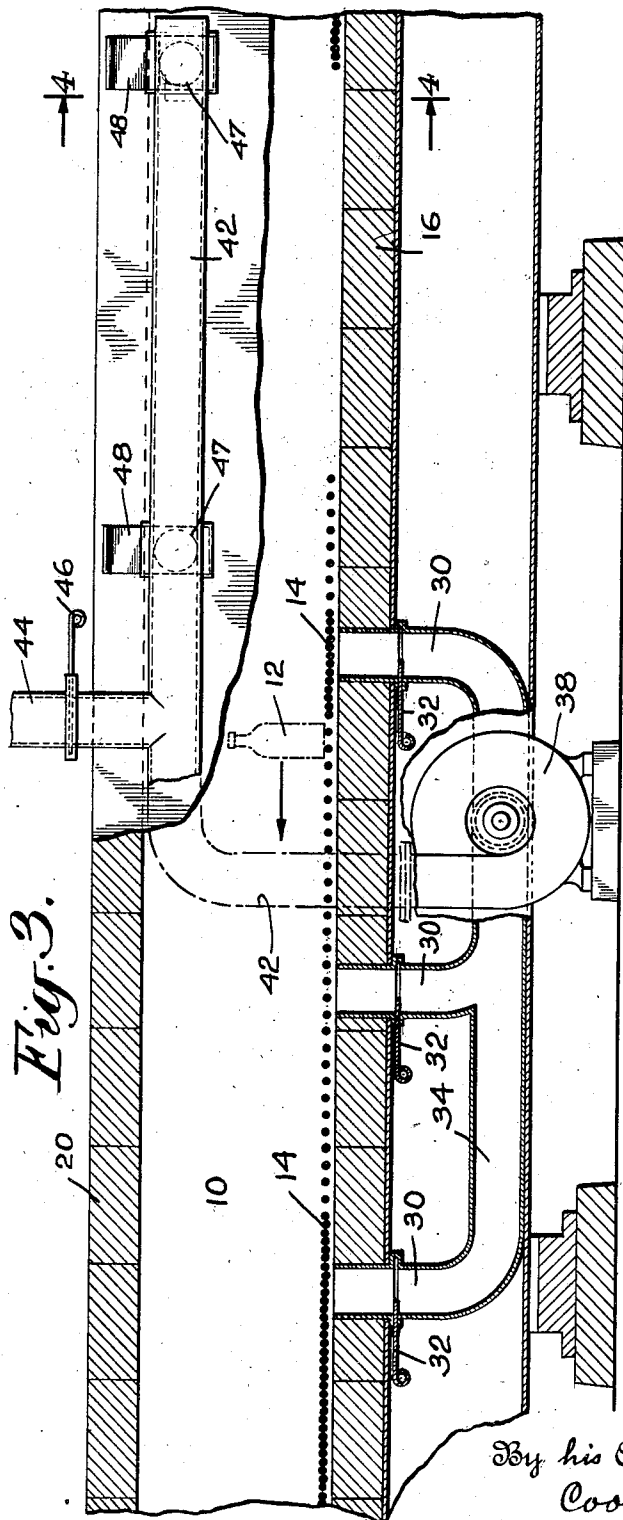
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UNITED STATES PATENT OFFICE

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LEER

Application filed October 1, 1927. Serial No. 223,450.

This invention relates to leers for annealing glassware, and pertains particularly to means for controlling the cooling of leers in order to increase their efficiency.

In the annealing of glass vessels it is considered good practice for the ware to come out of the rear end of the leer at a temperature low enough for the hand to bear.

The rear end of the leer is open to permit discharge of the ware, while the front end is at least partially open to admit new ware. Under these conditions there is usually a draft or current of air from either the front or rear of the leer, and these drafts are difficult to control.

If the draft is from the rear of the leer the front end will have a higher temperature than if the draft is from the front, and the ware will come from the leer much cooler than if the draft were at the other end.

It is of the utmost importance to be able to control the temperatures and the attendant annealing conditions throughout the whole length of the leer.

The temperatures are largely dependent on the flow of air through the leer, and the principal object, therefore, of the present invention is to provide improved means for controlling the air flow and thereby controlling the working temperatures in different parts or zones of the leer.

In some cases attempts have been made to secure proper working temperatures by controlling, or rather obstructing the flow of air by means of bulkheads or shields in the leer but such attempts have not been satisfactory.

In other cases cold air from a blower or fan has been introduced at the rear in an attempt to maintain proper temperatures, but this scheme has not been successful on account of the danger of cooling the ware too rapidly, thereby setting up strains in the ware which cause it to break readily.

The present invention is illustrated and described in connection with the leer disclosed in detail in the application of Orrie Shackelford, Serial No. 187,470, filed April 29, 1927.

Only such parts of the leer are herein de-

scribed as are necessary to an understanding of the invention.

In the Shackelford leer, an air duct extends along the bottom of the leer. The duct is connected, at intervals, to the interior of the leer through damper-controlled openings in the brickwork of the bottom of the leer. An exhaust fan connected to the air duct serves when desired to draw air into the leer at the rear for cooling the ware. Thus air is drawn or sucked through the rear of the leer instead of being blown into the leer as described above. Although this method works better than the blowing method, it is not entirely satisfactory on account of the ever present difficulty of controlling the direction of draft, which should always be outward at the front of the leer in order to produce best results.

The method herein disclosed is intended to place control of leer temperature in the hands of the operator, regardless of other operating conditions. In this system air is drawn into the leer from the rear, is heated by the ware over which it passes, is passed into an air duct through the openings in the leer bottom, and then is forced back into the leer at a point further toward the front of the leer than the openings in the leer bottom through which the air previously passed.

This arrangement allows a very nice adjustment of temperatures, with an ample out-draft or "sting-out" at the front of the leer.

Further and other objects and advantages will be hereinafter set forth in the accompanying specification and claims, and shown in the drawings, which by way of illustration show what is now considered to be the preferred embodiment of the invention.

Fig. 1 is a side view of the complete leer.

Fig. 2 is an enlarged plan view of a portion of the leer showing the present invention.

Fig. 3 is a cross-section on the line 3—3 of Fig. 2.

Fig. 4 is a cross-section on line 4—4 of Fig. 3.

The leer comprises a long oven-like structure into which the pieces of ware enter one at a time at the right end, to be distributed into rows crosswise of the leer and then con-

ducted through the leer by conveyor rollers 14 to the discharge opening at the left end of the leer.

The leer has a bottom 16, walls 18, and roof 20, all of brick.

The conveyor rollers 14 which form the floor of the leer are driven by motor 20 through suitable transmission gears and chains 22 and 24.

Above the annealing chamber of the leer is a muffle furnace 26 provided with a stack 28.

All of the above construction is described in detail in the above mentioned Shackelford application.

For the purpose of the present invention, openings 30 are provided at spaced intervals in the bottom of the leer. Three openings are shown, but any desired number may be used at any desired locations, either in the bottom of the leer or otherwise. Each opening 30 is provided with a damper 32 and all are connected by header 34 and pipe 36 to the suction inlet of exhaust fan 38, which is driven by motor 40.

Discharge pipe 42 is conducted vertically from the fan and then horizontally along the side of the leer near the top thereof. Pipe 42 is provided with a stack 44 having a damper 46. Tapped into the horizontal run of pipe 42 are a plurality of spaced horizontal pipes 46 extending crosswise of the inside of the leer, each cross pipe being provided with a damper 48. Pipes 46 have openings to permit discharge of air into the leer as indicated by the arrows.

In operation, hot air is drawn by fan 38 through any or all of the openings 30 as determined by the settings of dampers 32. This heated air is forced through pipe 42 and discharged through stack 44 or through any or all the cross pipes 46 in proportions determined by the settings of dampers 46 and 48.

This arrangement enables the operator to establish and maintain control of both draft and temperature, with the result that the efficiency of the leer is greatly improved.

It is to be understood that the invention is not limited to the construction herein specifically illustrated but can be embodied in other forms without departure from its spirit.

I claim:—

1. In a leer, in combination, means for drawing atmospheric air into the rear of the leer, means for thereafter withdrawing said air from the leer, and means for returning any desired portion of said air into the leer at a point in said leer further removed from the rear of the leer than the point of withdrawal.

2. In a leer having front and rear ends and a conveyor for moving articles of glassware therethrough from front to rear, in combination, means for drawing atmospheric air through the rear of said leer and over the glassware within the rear of the leer whereby said ware is cooled and said air is heated;

means for withdrawing said air from the leer at a point removed from the rear thereof, and means for subsequently returning said air into the leer at a point still further removed from the rear thereof.

3. In a leer, in combination, an air inlet at the rear of said leer, a second air inlet in said leer at a point removed from the rear thereof, an air outlet from the leer between said air inlets, and means for creating a flow of air into said rear inlet, out said outlet and into said second inlet for the purpose set forth.

4. In a leer having front and rear ends and a conveyor for moving articles of glassware therethrough from front to rear, in combination, means for creating a flow of atmospheric air through the rear portion of said leer in a direction opposite to the movement of the glassware, and means for bypassing said flow from the leer for a portion of the length thereof to re-enter the leer at a point further towards the front thereof, whereby a comparatively quiescent zone is provided in the leer between two zones in which atmospheric air is flowing from the rear towards the front of the leer.

In testimony whereof I hereto affix my signature.

JOHN MAYO.