No. 834,012. PATENTED OCT. 23, 1906

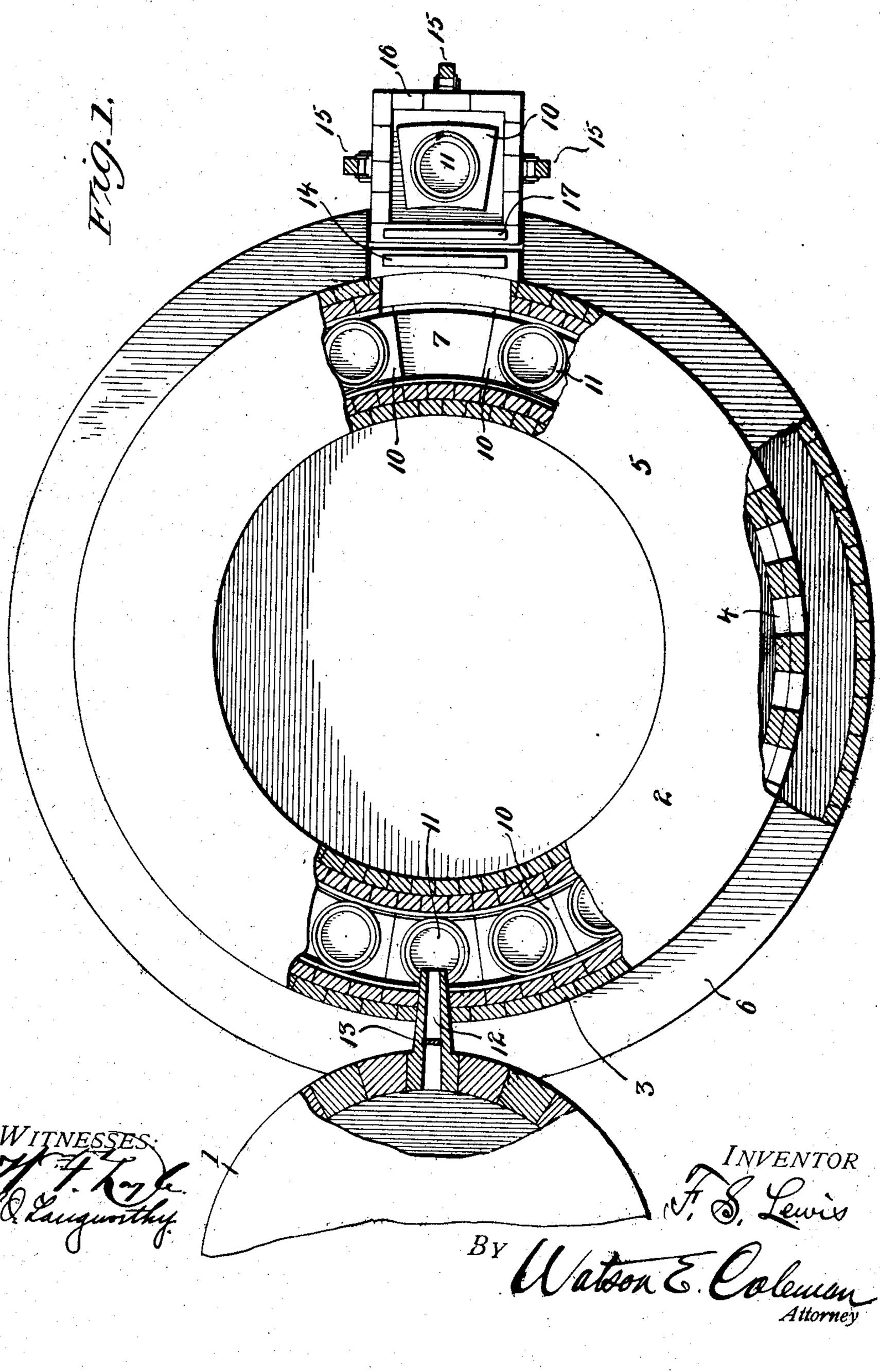
F. S. LEWIS.

AUTOMATIC GLASS BLOWING APPARATUS.

APPLICATION FILED FEB. 17, 1906.

2 SHEETS-Sheet 1.

Fig. 1.



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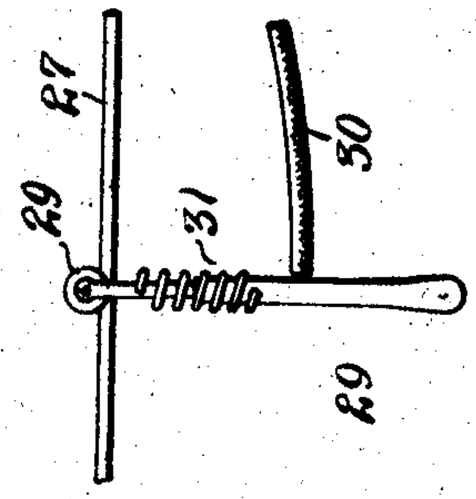
2 SHEETS—SHEET 2.



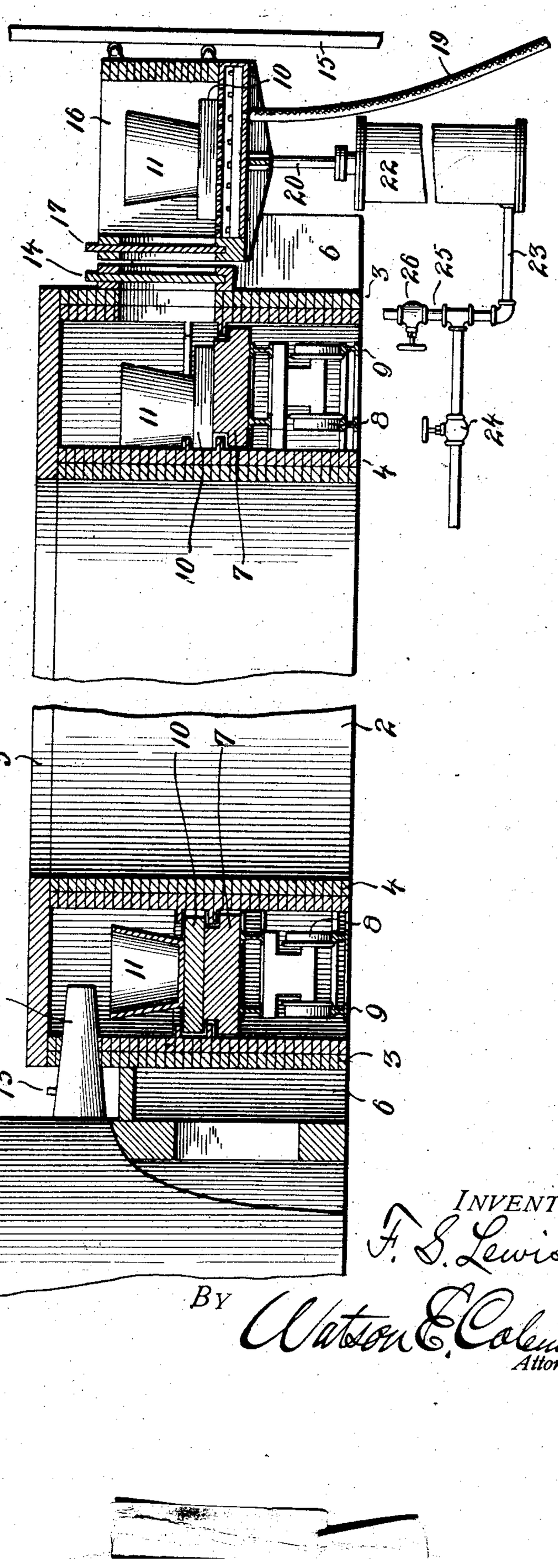


Fig. 2.

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AUTOMATIC GLASS-BLOWING APPARATUS.

No. 834,012. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed February 17, 1906. Serial No. 301,666.

To all whom it may concern:

Be it known that I, FRED S. LEWIS, a citizen of the United States, residing at Port Allegany, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Glass-Blowing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates generally to an improvement in glass manufacturing, and particularly to an automatic glass-blowing apparatus.

The main object of the present invention is the production of an automatic glass-blowing apparatus wherein the material is automatically delivered from the melting-tank into pots arranged for travel along a definite path, the charged pots being transferred to an elevator and moved into coöperation with a blowing apparatus.

Another object is to maintain an even temperature throughout the apparatus, whereby the glass is maintained in the desired molten state during transit from the tank to the blower.

The preferred details of construction will be described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan, partly in section; and Fig. 2 is a vertical section and also showing the blowpipe in operative position.

Referring particularly to the drawings, 1 represents an ordinary tank in which the glass is initially brought to the desired molten state. This tank, hereinafter termed the "melting-tank," may be of any desired construction and heated in any desired manner, as such details form no material part of the present invention.

Arranged adjacent the tank 1 is a housing 2, preferably circular in plan, comprising spaced parallel walls 3 and 4 and a cap-block 5. The walls 3 and 4 are of usual construction for such purposes, comprising an outer covering of red brick with an interior lining of fire-brick. Surrounding the housing is a heating-ring 6, commonly called "checker-work," which in this particular instance is in open communication with the checker-work of the melting-tank, so that a circulation of intense heat is gained about and in direct contact with the outer wall of the housing.

Within the housing is mounted a circular or endless rim or table 7, mounted for movement upon wheels 8, arranged for travel upon a track 9, fixed on the floor of the housing, any suitable means being used to cause the necessary travel of the table. On the table, preferably at equidistant points circumferentially thereof, is arranged a series of blocks 10, of stone or fire-clay, and on each block is fixed or otherwise arranged a receptacle or pot 11. A delivery-spout 12, provided with a cut-off 13, provides communication between the glass-chamber of the tank 1 and the housing 2, the mouth of the spout being arranged above the plane of the pots 11, so that the operator may fill said pots in succession with material from the tank.

Diametrically opposite the spout 12 the checker-work of the housing is interrupted, and the outer wall of the housing is provided at this point with a door 14, adapted to be manually controlled for raising and lowering in any suitable way. Adjacent the opening in the housing are arranged vertical guides 15, on which is mounted for vertical movement an elevator 16. The elevator is open at top and comprises four side walls and a bottom, the side wall next the housing being preferably arranged as a sliding door 17, adapted for raising and lowering as is door 14. The elevation is interiorly of a size to receive one of the blocks 10 and is in communication with a source of fuel-supply, as a gas-tank 18, through a pipe 19. The gas is designed for ignition within the elevator, whereby to maintain the molten state of the glass, as will later appear.

The elevator is supported on a standard 20, connected directly with a piston 21, arranged within a cylinder 22. The cylinder is in communication with a source of pressure, as an air-tank, through a pipe 23, leading into the cylinder below the piston and controlled by a valve 24. An exhaust-pipe 25, valved at 26, branches from the pressure-pipe to permit reduction of the pressure within the cylinder.

Above the elevator is arranged an endless track 27, on which travels a track-wheel 29,

from the hanger of which depends a blowpipe, connected with an air-supply by a flexible pipe or tube 30. The connection between the blowpipe and hanger is preferably yielding, as by the use of a coil-spring 31, to permit a slight independent upward movement of the blowpipe, if necessary.

In operation the pot 11 opposite the mouth of the spout is filled to the desired extent with the molten glass and the table rotated to bring the next successive pot into charging position, the operation being continuous, as will be understood. As the initially-filled pot reaches the door 14 both said door and the door 17 of the elevator are raised, and the block 10, carrying the filled pot, is forced onto the elevator-floor, the gas in the latter having of course been previously ignited. Pressure is admitted to the cylinder 22 and the elevator moved upward until the mouth of the blowpipe 29 is met and forced into the molten glass in the pot. The valve 24 is closed and the valve 26 opened, permitting the elevator to descend. At the same time air under pressure is admitted to the blowpipe. The descent of the elevator leaves a cylindrical mass of glass hanging to the blowpipe, which under the influence of the air may be shaped as desired. Upon the descent of the elevator to the normal point the glass is cut off just above the pot therein, the doors 14 and 17 are opened, and the block and pot returned to original position upon the table 7. The blowpipe, with depending mass, may be moved to place of deposit through use of track 27 and a successive blowpipe positioned for use with the next successive pot presented by the elevator.

It is of course to be understood that the mouth of the blowpipe may be arranged at any desired distance above the normal position of the elevator, so that the length of the mass of glass supported by the blowpipe may be varied to suit the particular occasion.

The main and important characteristic of the above apparatus is that the molten glass from the time of its discharge from the tank to its engagement by the blowpipe is maintained at an even and proper temperature, insuring the proper and perfect results obtainable in no other way.

Having thus described my invention, what I claim as new is—

1. An apparatus of the character described comprising a melting-tank, a movably-mounted spring-actuated blowpipe, and means for conveying the material from the tank to the blowpipe and maintaining its tank temperature during transit.

2. An apparatus of the character described comprising a melting-tank, a movably-mounted spring-actuated blowpipe arranged above the tank, and means for conveying the material to the blowpipe and maintaining its temperature during transit.

3. An apparatus of the character described comprising a melting-tank, an elevator, means for raising and lowering the elevator, an endless carrier interposed between the tank and the elevator whereby the material is transmitted from the tank to the elevator, and means for maintaining the tank temperature of the material during transmission, in combination with a movably-mounted spring-actuated blowpipe so positioned as to contact the molten material during the upward travel of the elevator, and means for heating the elevator.

4. In an apparatus of the character described, a melting-tank, an elevator, means for raising and lowering the elevator, means for conveying the material from the tank to the elevator and maintaining tank temperature during transit, and means for heating the material within the elevator, in combination with an endless track arranged above the elevator, and a spring-actuated blowpipe arranged to travel on the track and so positioned as to contact the material during the upward travel of the elevator.

5. An apparatus of the character described comprising a melting-tank, an elevator, means for delivering molten material from the tank to the elevator and maintaining its temperature during transit, means for maintaining the temperature of the material within the elevator, and means for raising and lowering the elevator, in combination with a movably-mounted spring-actuated blowpipe so positioned as to contact the molten material during the upward travel of the elevator.

6. In an apparatus of the character described, a melting-tank, a housing, means for heating the housing, an endless carrier rotatably mounted within the housing, pots mounted on the carrier, means for delivering the material from the tank to the pots, an elevator adapted to successively receive the pots from the carrier, means for maintaining the temperature of the material within the elevator, means for raising and lowering the elevator, and a movably-mounted spring-actuated blowpipe so positioned as to contact the molten material during the upward travel of the elevator.

7. A melting-tank, a housing, means for heating the housing, an annular carrier mounted for movement within the housing, pots supported on said carrier, a means of communication to deliver material from the tank to the pots on the carrier, an elevator arranged adjacent an outlet from the housing, said elevator being adapted to successively receive the pots from the housing, means for heating the elevator, and a blowpipe arranged above and in the path of travel of the elevator.

8. A melting-tank, an elevator, means for delivering molten material from the tank to the elevator and maintaining its temperature

during transit, means for maintaining the temperature of the material within the elevator, and means for raising and lowering the elevator, in combination with a movably-mounted spring-actuated blowpipe so positioned as to contact the molten material during the upward travel of the elevator.

9. An apparatus of the character described comprising a melting-tank, an elevator, means for delivering molten material from the tank to the elevator and maintaining its temperature during transit, means for maintaining the temperature of the material during transit, means for maintaining the temperature of the material within the elevator, and means for raising and loweringthe elevator, in combination with an endless track, a track-wheel thereon, and a spring-actuated blowpipe depending from the wheel and so positioned as to contact the molten material during the upward travel of the elevator.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

FRED S. LEWIS.

Witnesses:
P. L. TYLER,
R. A. BARNETT.