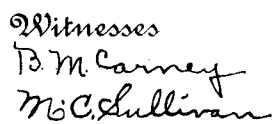


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4 SHEETS—SHEET 1.



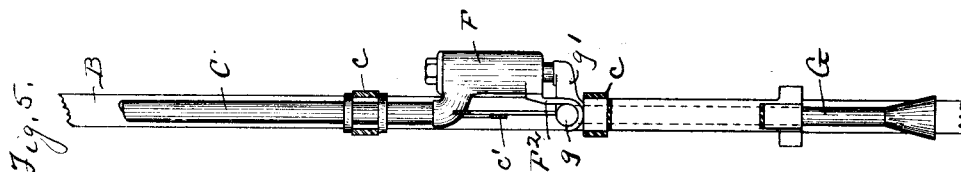
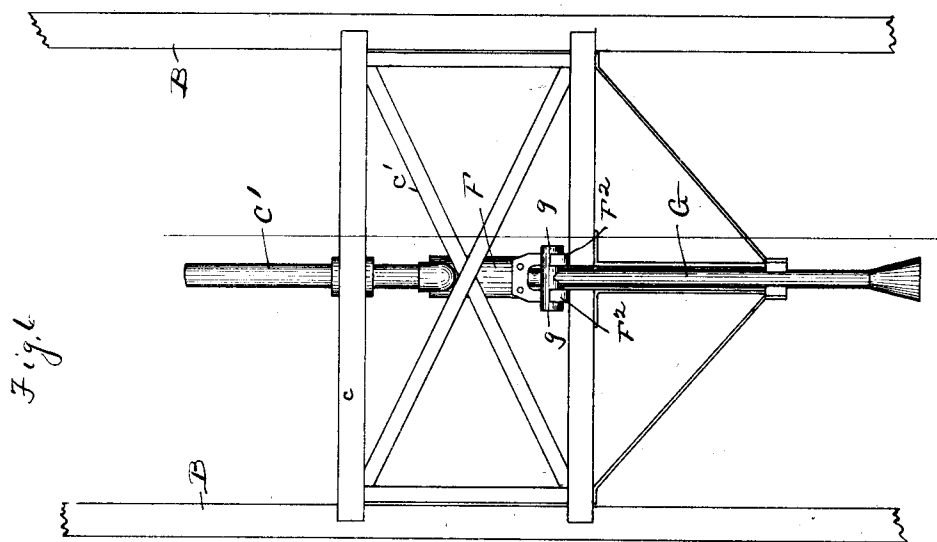
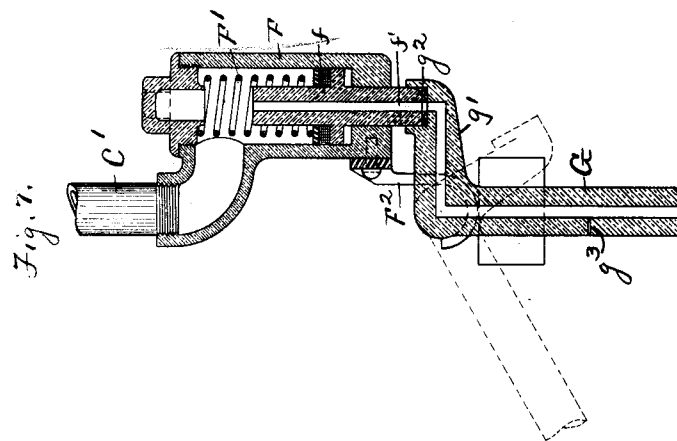
Inventor
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C. E. VOLK.
GLASS BLOWING MACHINE.
APPLICATION FILED OCT. 27, 1905.

Patented Mar. 30, 1915.

4 SHEETS—SHEET 2.



Witnesses
B. M. Carney
McC. Sullivan

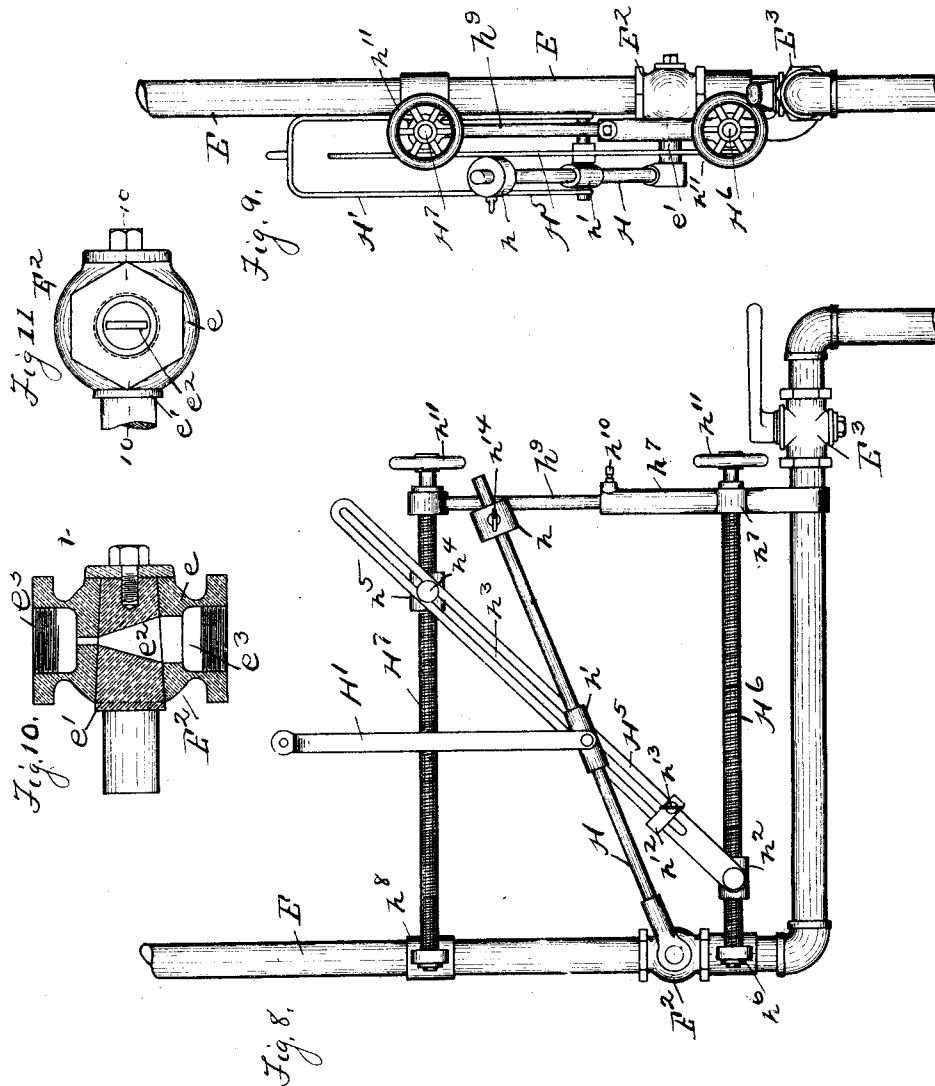
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Witnesses
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M. C. Sullivan

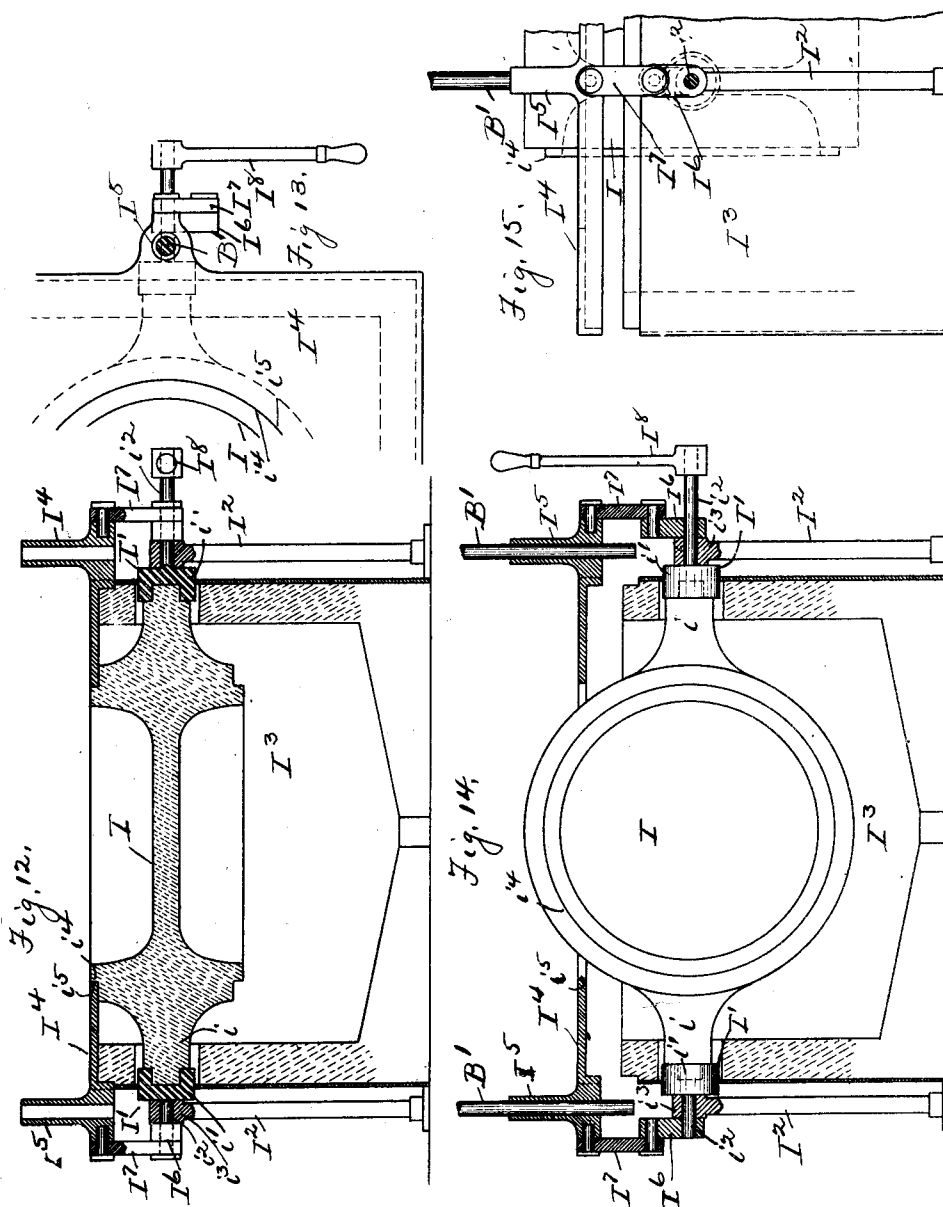
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4 SHEETS-SHEET 4.

1,133,764.



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UNITED STATES PATENT OFFICE.

CHARLES E. VOLK, OF ERIE, PENNSYLVANIA.

GLASS-BLOWING MACHINE.

1,133,764.

Specification of Letters Patent.

Patented Mar. 30, 1915.

Application filed October 27, 1903. Serial No. 384,767.

To all whom it may concern:

Be it known that I, CHARLES E. VOLK, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Glass-Blowing Machines, of which the following is a specification.

This invention relates to glass blowing machines and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

One of the objects of the invention is to provide a means whereby the effective air in the cylinder being blown may be automatically varied to suit the requirements. This is preferably done by varying the volume of air supply through the blow pipe. It is also preferable to increase the air rapidly with the initial movement or operation of the pipe, and while it is desirable to continue the increase during the later stages of the operation, it is desirable to make the increase less rapid during those stages.

Another object of the invention is to provide a cover for the chamber carrying the pot for the molten glass, which will be automatically lifted to permit the pot to be turned with each operation.

Further objects of the invention relate to details of construction and will appear more fully from the description and claims.

The invention is illustrated in the accompanying drawings as follows:—

Figure 1 shows a plan view of the machine. Fig. 2, a front elevation. Fig. 3, a fragment of mechanism for operating the cage. Fig. 4, a side elevation of the machine. Fig. 5, a fragment of the air pipe showing means of connecting the blow pipe therewith. Fig. 6, a front elevation of the same. Fig. 7, a sectional view of the connection between the blow pipe and the air pipe. Fig. 8, a front elevation of the supply controlling means. Fig. 9, a side elevation of the same. Fig. 10, a section of the controlling valve on the line 10—10 in Fig. 11. Fig. 11, a view of the same valve, the same being from the bottom of Fig. 10. Fig. 12, a central section of a pot and chamber containing the same, the cover being in operative position thereon. Fig. 13, a plan view of a portion of the same. Fig. 14, a section similar to that of Fig. 12 with the

cover raised and the pot partly turned. Fig. 15, a side elevation of a portion of the same parts.

A marks the frame of the machine which is of the ordinary construction and has arranged within it the guides B. The cage C operates on these guides and has the cross pieces *c* and brace bars *c'*. It is suspended by means of the air pipe *C'*, the air pipe being provided with a rack *c''*. This rack engages a gear D which is fixed on the shaft D' at the top of the machine. The rack is held in engagement by means of the guide pulley *C''*, the guide pulley being mounted in the bracket *c''*. Any desirable means of driving the shaft D' may be used but I prefer driving it by the electric motor D² having the worm *d* and gear *d'* as a means of transmission. The clutch D³ is arranged on the shaft D' by means of which the shaft D' may be disconnected from the motor. The cage C returns or moves downwardly by means of gravity and is carried upwardly as the clutch is set through the action of the motor.

A telescopic connection is provided between the pipe *C'* and downward extension *E'* of the pipe E. A gland *e''* is arranged at the top of the pipe *C'* for making a tight joint. The air pipe E is provided with the controlling valve *E'*. This controlling valve is of the plug valve type and comprises the chamber *e* in which the plug *e'* operates. The plug *e'* has the way *e''* through it which is adapted to be brought into register with the passages *e'* of the valve. The passage *e''* is preferably formed with parallel walls at one side so that a given movement of the plug will effect a proportionate opening of the passage *e''*. The shape of the port *e'* is clearly shown in Figs. 10 and 11. The valve is operated by a rod H. A weight *h* is arranged on this lever and tends to draw it down through gravity. The weight may be adjusted by means of the set screw *h''*. A sliding connection *h'* is threaded onto the lever H. The strap *H'* is secured to this sliding connection. A cable *H''* extends from this strap over the pulley *H''* and is attached to the rack *H''*. The rack *H''* meshes with a gear D⁴ on the shaft D'. From this it will be seen that as the cage C is raised the sliding connection *h'* is simultaneously raised, moving however a much less distance. The sliding connection *h'* is slidingly mounted on a variation bar *H''*. This variation bar is

hinged at the bottom on a nut h^2 . The nut h^2 is carried by the screw H^6 . The screw H^6 is journaled in the bracket h^8 and the upright h^7 . The upper end of the bar is slidably mounted by means of the stud h^4 on the nut h^5 , the stud h^4 extending through the slot h^3 in the bar. The nut h^5 is mounted on the screw H^7 and the screw H^7 is journaled in the bracket h^8 and upright h^7 . The upright h^9 is telescopically mounted in the upright h^7 and may be fixed in adjustment by the set screw h^{10} . Hand wheels h^{11} are provided for operating the screws. A stop h^{12} is preferably arranged on the variation bar which limits the downward movement of the lever H so that some initial air may be had if desired and it may be adjusted and fixed in adjustment by means of the set screw h^{13} .

In the operation of the device the sliding connection h' with the parts arranged as shown in Fig. 8 is much nearer the valve E^2 in its initial position than in its upper position. As a result of this the effective arm of the lever H is much shorter in the initial movement than in the later stages, so that with a given movement of the strap H' there is a more rapid opening of the valve with the initial movement of the strap H' than during the later stages. This variation may be adjusted as desired by varying the angle of the bar H^5 , in fact the variation may be reversed. I prefer however to have the initial movement more rapid as shown.

The shut off or controlling valve E^3 as provided is common.

On the end of the air pipe C' a spring connection chamber F is secured. The sliding plug f is arranged in this chamber and is pressed outwardly by a spring F' . A passage f' extends through the plug. The blow pipe G has the lugs g arranged at the upper end thereof and an elbow g' extending therefrom. A connecting socket g^2 is placed in the upper face of this elbow. The hooks F^2 are secured to the chamber F and extend downward in proper position to engage the lugs g . The lugs are placed in these hooks with the pipe in position as shown in Fig. 7. As the tube is dropped it brings the socket g^2 against the end of the plug f so that a connection with the air is made. The usual waste or vent g^3 is arranged in the blow pipe.

The pot I is of the usual form and mounted in the chamber I^3 . It has the lugs i which fit in the thimbles i' of the trunnions I^1 . The journal pins i^2 extend from the thimbles i' and are arranged in the bearings i^3 on the uprights I^2 . The cover I^4 has the opening i^5 which is arranged to fit around the shoulder i^4 on the top of the pot. The slides I^5 are fixed on the side edges of the cover and operate on the guides B' ex-

tending from the guides B . Cranks I^6 are fixed on the pins i^2 and links I^7 connect these cranks with the slides I^5 . A handle I^8 is fixed on one of the pins i^2 by means of which the position of the pot may be reversed. As it is swung over in either direction, the cranks operating through the links I^7 force upwardly the slides I^5 and these carry with them the cover I^4 . This upward movement of the cover permits of the movement of the pot, the cranks being of sufficient length to lift the cover a sufficient distance to clear the pot as it is turned, as clearly shown in Fig. 14.

In the broader features of my invention I do not wish to be limited to automatically varying the air actually supplied through the blow pipe but wish to include devices wherein the effective air supply is automatically varied.

In the operation of the machine the molten glass is placed in the pot I . The blow tube is brought into proper relation with the glass in the ordinary manner. The tube is then drawn upwardly through the action of the motor through the gear D and rack c^2 . Just prior to the starting movement air is turned on by means of the valve E^3 . The air is automatically varied by the valve E^2 and its operating mechanism as the cage with the blow pipe is lifted so as to give the proper supply of air to the cylinder in its different stages. After the cylinder is of sufficient length it is taken with the blow pipe from the machine. The mechanism shown in Fig. 7 facilitates the removal of the blow pipe.

What I claim as new is:—

1. In a glass blowing machine, the combination of the blow pipe; means for supplying air thereto; a valve controlling the effective air supply; a lever operating said valve; a variation bar arranged at an angle to said operating lever; a connection slidably mounted on said operating lever and variation bar; and means operating said connection as the pipe is operated.

2. In a glass blowing machine, the combination with the blow pipe; of means for supplying air thereto; a valve controlling the effective air supply; a lever operating said valve; a variation bar arranged at an angle to said operating lever; a connection slidably mounted on said operating lever and variation bar; means operating said connection as the pipe is operated; and means for adjusting the variation bar.

3. In a glass blowing machine, the combination of the blow pipe; means for supplying air thereto; a valve controlling the effective air supply; a lever operating said valve; a variation bar arranged at an angle to said operating lever; a connection slidably mounted on said operating lever and variation bar; means operating said connection

as the pipe is operated; and screws for adjusting the angle of the variation bar.

4. In a glass blowing machine, the combination with the blow pipe; of means for supplying air thereto; a valve controlling the effective air supply; the operating lever H arranged to operate said valve; the variation bar H⁵ having the slot h³ therein; the sliding connection h' slidingly mounted on the lever H and bar H⁵; screws H⁶ and H⁷ for adjusting the angle of the variation bar; and means for adjusting the distance between said screws.

5. In a glass blowing machine, the combination with the blow pipe; of means for supplying air thereto; a valve controlling

the effective air supply; the operating lever H arranged to operate said valve; the variation bar H⁵ having the slot h³ therein; the sliding connection h' slidingly mounted on the lever H and bar H⁵; screws H⁶ and H⁷ for adjusting the angle of the variation bar; means for adjusting the distance between said screws; and the stop h¹² for adjusting the initial opening of the valve.

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

CHARLES E. VOLK.

Witnesses:

H. C. LORD,

M. C. SULLIVAN.