C. M. CLARKE.

VALVE MECHANISM FOR GLASS BLOWING APPARATUS.

APPLICATION FILED MAR. 23, 1907.

900,914.

Patented Oct. 13, 1908.

2 SHEETS—SHEET 1.

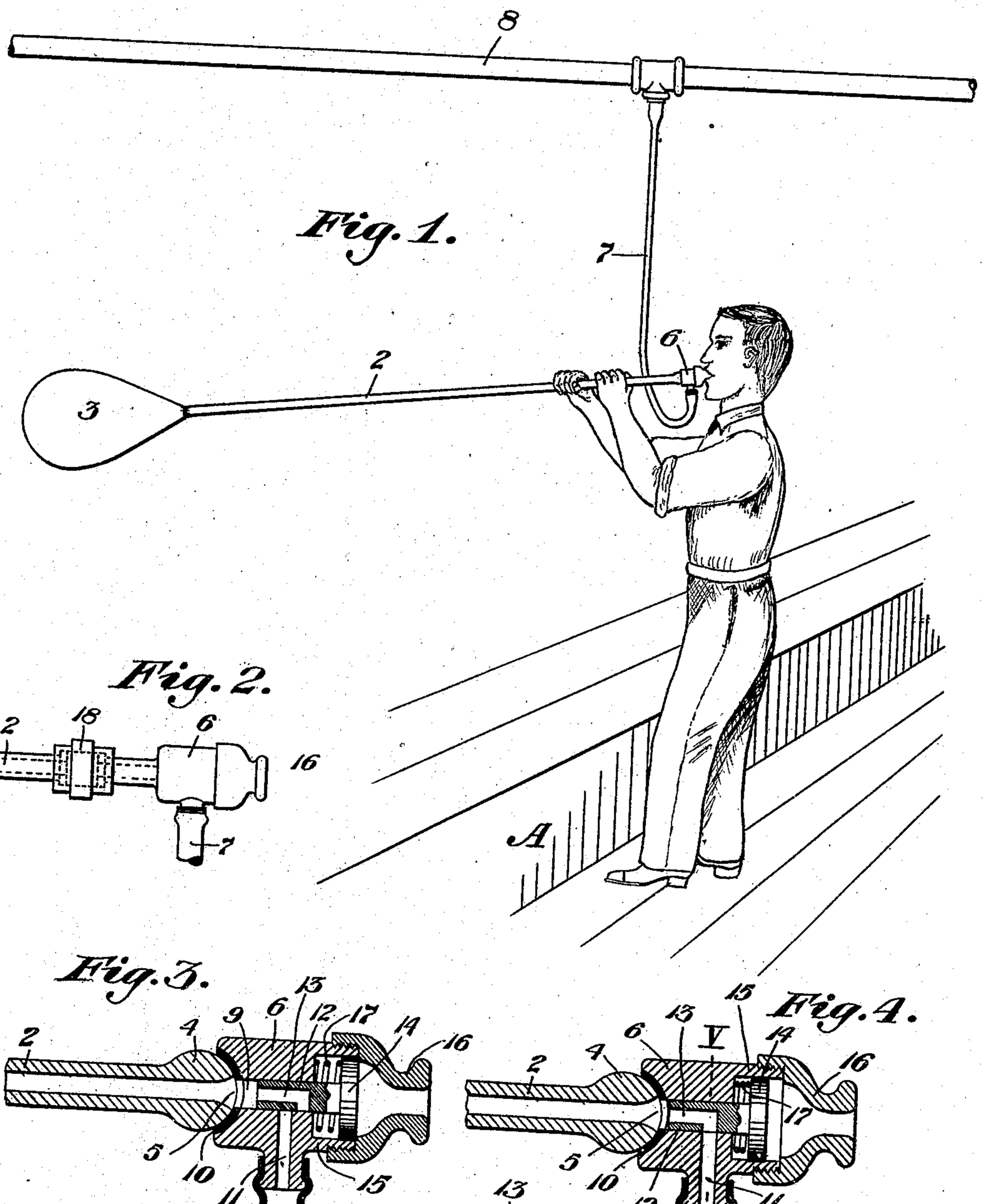


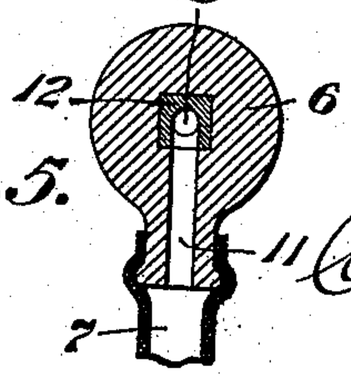
Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

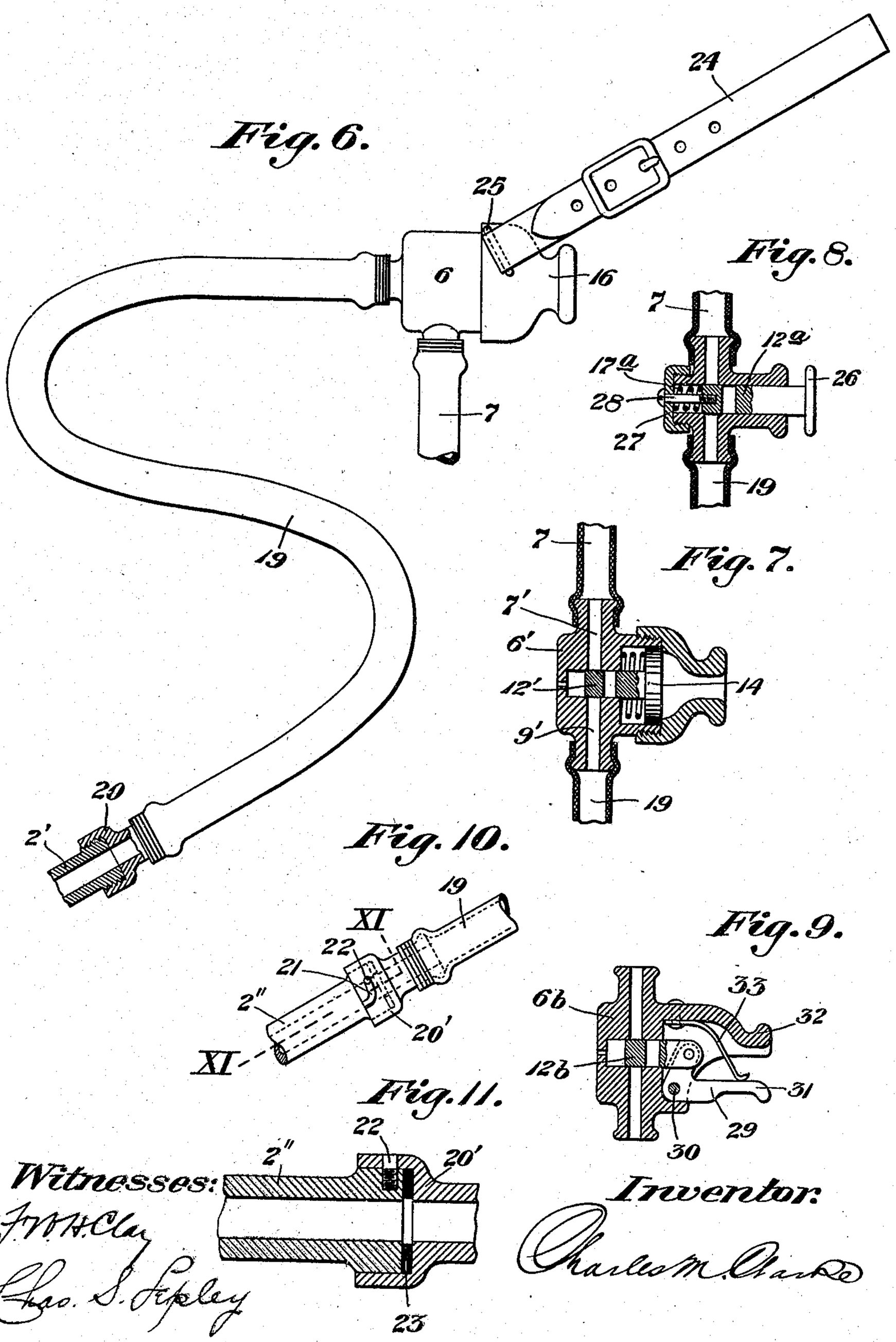

Fig. 8.

Fig. 7.

Fig. 10.

Fig. 9.

Fig. 11.

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UNITED STATES PATENT OFFICE.

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VALVE MECHANISM FOR GLASS-BLOWING APPARATUS.

No. 900,914. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed March 23, 1907. Serial No. 364,081.

To all whom it may concern:

Be it known that I, CHARLES M. CLARKE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Valve Mechanism for Glass-Blowing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to an improvement in valve mechanism for glass blowing apparatus and it has for its object to provide means whereby an artificial air pressure may be controlled by the mouth of the operator, either by pressure of the breath, or by the tongue, or closing of the teeth, to actuate a valve controlling the flow of such artificial pressure.

In the operation of blowing glass as ordinarily practiced, the glass article is formed on the end of a blow pipe, partially by internal air pressure from the lungs of the blower, and partially by the manipulation of the blow pipe to shape it. A common instance of such operation is in the manufacture of hand-blown window glass.

Different kinds of mechanism have been designed for the purpose of utilizing artificial pressure, also controlling valves adapted to be manipulated in different ways and under control of the operator.

The present invention is particularly designed to utilize the skill and training of the glass blower who is accustomed to "hand-blowing" and to enable him to accurately and delicately control the flow of the expanding fluid as desired, by manipulation of a valve controlled by one of the physical organs of the mouth or by the pressure of his breath.

Referring to the drawings: Figure 1. is a view showing the operation of using my improved apparatus. Fig. 2. is a detail view of the inner end of the blow pipe and valve in elevation, and illustrating the use of a swiveling joint in the pipe itself. Figs. 3. and 4 are vertical longitudinal sections on an enlarged scale showing the inner end of the blow pipe in communicating register with the air supply passage, the valve being closed and open respectively. Fig. 5. is a vertical sectional view on the line V. V. of Fig. 4. Fig. 6. is a view in elevation showing a modified construction employing flexible tubing between the valve mechanism and the blow pipe. Fig. 7. is a sectional view similar to Figs. 3 and 4 showing a modified arrangement for use with a flexible tubing connection. Fig. 8. is a sectional detail view showing a modified construction of valve, for control by the tongue. Fig. 9. is a similar view showing a further modification adapted for manipulation by the closing movement of the teeth of the operator. Fig. 10. is a detail view in elevation showing a bayonet joint connection for the inner end of the blow pipe and the air supply tube. Fig. 11. is a longitudinal sectional view on the line XI XI of Fig. 10, on an enlarged scale.

2 represents the blow pipe, of well known construction, on the outer end of which the article 3 is formed by expansion due to the air forced through it, the blow pipe being manipulated from time to time, either by swinging in a pit A or by other manual manipulation, as is well understood.

In the principal figures of the drawings the inner end of the blow pipe 2 is provided with a rounded or bulbous terminal 4 having a globular seat adapted to make a tight joint with the seat of the valve casing, the inner cavity of the pipe preferably terminating in a flared exit opening 5 so as to insure register with the air supply port of the valve at varying angles.

6 is the valve casing connected by flexible pipe 7 with main supply pipe 8 or any other source of air pressure as will be readily understood. The casing 6 is provided with an air supply port 9 opening to the exterior and preferably surrounded by a concave seat having a cushion 10 of rubber or other suitable material so as to insure an air-tight joint between the end of the blow pipe and the valve. Communicating with the supply passage 9 is a port 11 through which air from the connecting tube 7 is furnished to port 9 when the valve port is in registering position, as shown in Fig. 4.

12 represents a slide valve of any suitable construction having a port 13 adapted to place the air supply port in communication with the blow pipe, as shown in Fig. 4, either for the full opening, or for any desired opening within the control of the operator, or the valve may entirely cut off the air supply, as clearly shown in Fig. 3. For the purpose of

manipulating said slide valve, it may be provided with any suitable actuating mechanism. In the principal figures of the drawings I have provided the valve with a piston head 14 mounted within a suitable cylindrical extension 15 of the casing 6 and covered by a mouth piece 16. Said mouth piece is preferably detachably secured upon the casing, adapted to control the outward travel of piston 14 and to be conveniently held between the lips or teeth of the operator for use.

17 is a spring inserted between the inner side of the piston and the casing, adapted to normally throw the valve to closed position, and it will be understood that said spring is of but slight resistance so as to be readily overcome by the pressure of the breath.

As thus constructed, the supply of air to the blow pipe may be delicately and accurately controlled by merely exerting the pressure of the breath against the piston, and the supply may be as readily cut off by withholding such pressure.

It will thus be seen that the supply of air is only furnished when the blow pipe is brought into engagement with the valve casing and the valve is opened, as shown in Figs. 1, 3 and 4 and that at other times when the supply is cut off the blow pipe may be freely removed, swung in the pit, or otherwise manipulated as is the general practice in the operation of "hand-blowing."

If it should be desired to connect the blow pipe with the valve in any other manner and to render it possible to rotate the pipe independent of such connection, a swiveling joint 18 may be employed as is clearly shown in Fig. 2, whereby the outer end of the pipe is completely independent of the inner connected section, although ordinarily the flexibility or desired movement may be accomplished by merely removing the blow-pipe from contact with the valve. If, however, it is desired to permanently connect the inner end of the blow pipe with the valve, the construction shown in Fig. 6 may be utilized by employing a section of flexible tubing 19 between the valve casing and the blow pipe 2′, of sufficient length to provide for all ordinary manipulation or swinging motion. The blow pipe 2′ may be secured to a terminal joint 20 as shown in said figure or it may be connected in any other suitable manner. In Figs. 10 and 11 I have shown said joint 20′ as being provided with a slot 21 for making a bayonet joint connection, the blow pipe 2″ having a pin 22 adapted to be inserted and rotated therein so as to make a tight locking engagement, as will be readily understood. For the purpose of insuring an air-tight joint, a packing disk 23 may be inserted between the section 20′ and blow pipe 2″ as clearly shown in Fig. 11.

Fig. 6 further shows an attachment to the valve case 6 for mounting it permanently on the head of the user, as by means of a strap 24 engaging staples 25 at each side of the valve casing structure and provided with a buckle as shown, or any other suitable means may be employed for attaching the valve to the head of the wearer. Such attachment is in some cases convenient, for the purpose of relieving the mouth of the user from strain.

In Fig. 7 I have shown a modified construction wherein the valve casing 6′ is provided with oppositely extending ports 7′ and 9′ adapted to communicate with the source of pressure and with the blow pipe respectively, and in convenient form for use with the flexible tubing 19 above described. The construction of the valve is otherwise the same, and it will be understood that in place of the piston 14, a diaphragm may be used for actuating the slide valve 12′, if desired.

In Fig. 8 I show a similar construction wherein the slide valve 12^a is provided with a terminal button or disk 26 adapted to be pressed inwardly by the tongue to control the flow of air, the construction otherwise being substantially the same as that of Figs. 3 and 4. For convenience the spring 17^a may be located at the opposite end of the valve, underneath a cap 27 as shown, excess outward travel of the valve being prevented by limiting screw 28 opposing the spring action.

In Fig. 9 the construction shown is adapted for manipulation by the teeth or jaws of the user, for which purpose the valve 12^b is mounted at its inner end upon a bell crank lever 29 pivoted at 30 in the case and having a backwardly projecting terminal 31 adapted to be engaged by the teeth of the under jaw of the user. The casing 6^b is likewise provided with an upper backward extension 32 for the same purpose and so formed as to be engaged by the upper teeth, while a spring 33 normally presses the lever 29 downwardly and holds the valve in a closed position. By this construction it will be seen that the movement of the valve may be delicately controlled by merely closing or opening the teeth to get the desired pressure opening, communication being entirely cut off by relieving the pressure of the teeth, whereupon the spring 33 will close the valve.

The advantages of the invention will be readily appreciated by all those familiar with the operation of hand-blowing. It entirely relieves the operator from the long continued excessive strain upon the lungs due to furnishing the entire volume of expanding fluid, while enabling him to utilize the same skill and accuracy in substantially the same manner as is shown in the former hand-blowing method, while the entire volume of expanding fluid is furnished from an outside source of supply.

The invention may be changed or varied in different details or features of construction by the skilled mechanic but all such changes are to be considered as within the scope of the following claims.

What I claim is:—

1. A glass blower's valve adapted for connection with a source of outside pressure and with a blowing tool respectively, and having a flow-controlling device for regulating said pressure arranged to be actuated from within the mouth when the valve is held therein.

2. A pressure-controlling implement for glass blowers consisting of a casing having means for connection with a source of outside pressure and with a blowing tool respectively, means whereby the implement may be held in the mouth, and a controlling valve capable of operation from within the mouth when so held.

3. A pressure-controlling implement for glass blowers consisting of a casing provided with an inlet and an outlet port adapted to be connected with an outside source of pressure and with a blowing tool respectively, and a slide valve therein adapted to control the flow through said port, said valve being provided with an operating terminal arranged for actuation by the operator when the implement is held in the mouth.

4. A pressure-controlling implement for glass blowers consisting of a casing provided with an inlet and an outlet port adapted to be connected with an outside source of pressure and with a blowing tool respectively, and a slide valve therein adapted to control the flow through said port, said valve having a terminal device for pressing the valve inwardly.

5. A pressure-controlling implement for glass blowers consisting of a casing provided with an inlet and an outlet port adapted to be connected with an outside source of pressure and with a blowing tool respectively, and a slide valve therein adapted to control the flow through said port, said valve having a terminal actuating device, and a holding terminal adapted to be grasped within the mouth of the operator.

6. A glass blower's valve mechanism having a port adapted for connection with an outside source of supply and with a blowing tool respectively, a slide valve arranged to control the circulation of fluid through said port, a holding terminal, and means connected with the slide valve whereby it may be actuated by pressure of the breath.

7. A glass blower's valve mechanism having a port adapted for connection with an outside source of supply and with a blowing tool respectively, a slide valve arranged to control the circulation of fluid through said port, a holding terminal, means connected with the slide valve whereby it may be actuated by pressure of the breath, and a retracting spring therefor.

8. A glass blower's valve mechanism having a port adapted for connection with an outside source of supply and with a blowing tool respectively, a holding terminal, and a slide valve arranged to control the circulation of fluid through said port provided with a piston extremity.

9. A glass blower's valve mechanism having a port adapted for connection with an outside source of supply and with a blowing tool respectively, a holding terminal, a slide valve arranged to control the circulation of fluid through said port provided with a piston extremity, and a retracting spring.

10. In a glass blower's valve, the combination of a casing having ports arranged to communicate with a source of outside pressure and with a blowing tool respectively, and a mouthpiece, and a valve arranged to control the circulation through said ports having an actuating terminal adjacent to said mouthpiece.

11. In a glass blower's valve, the combination of a casing having ports arranged to communicate with a source of outside pressure and with a blowing tool respectively, and a mouthpiece, and a valve arranged to control the circulation through said ports having a terminal piston located within the casing.

12. In a glass blower's valve, the combination of a casing having ports arranged to communicate with a source of outside pressure and with a blowing tool respectively, and a mouth controlled valve arranged to control the circulation through said ports.

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

CHARLES M. CLARKE.

Witnesses:
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Chas. S. Lepley.