

W. D. FREDRICK.
BLOW HEAD FOR GLASS BLOWING MACHINES.

APPLICATION FILED JUNE 6, 1906.

2 SHEETS—SHEET 1.

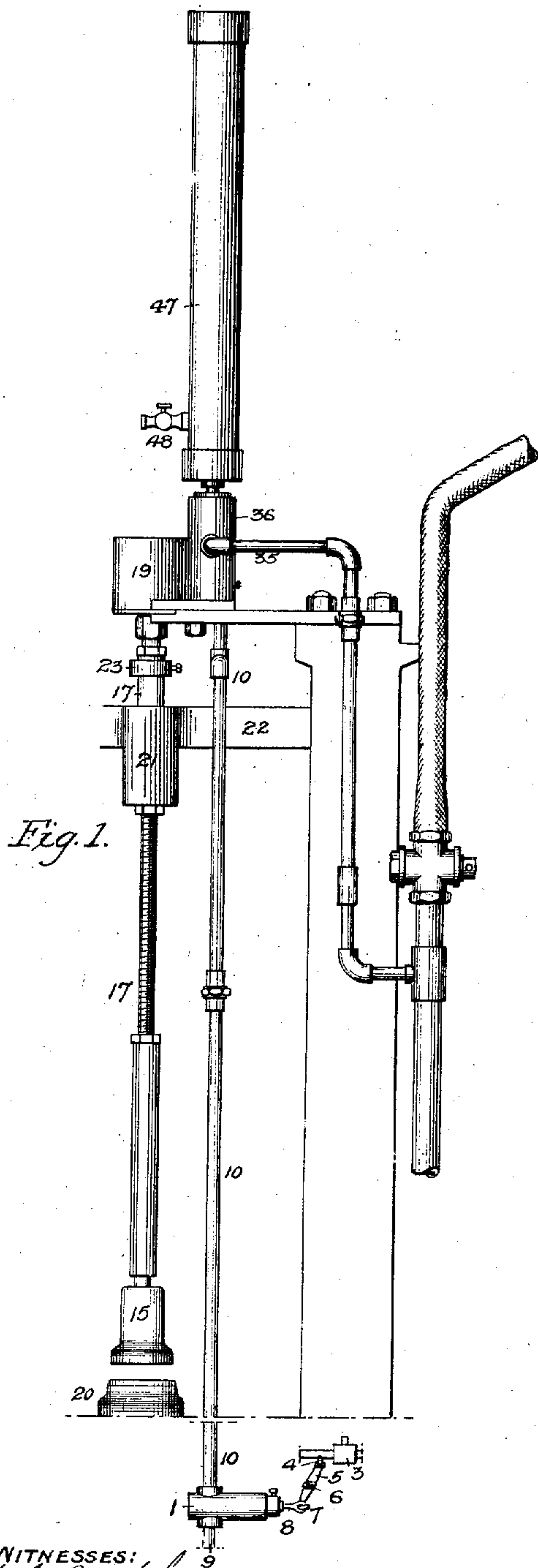


Fig. 1.

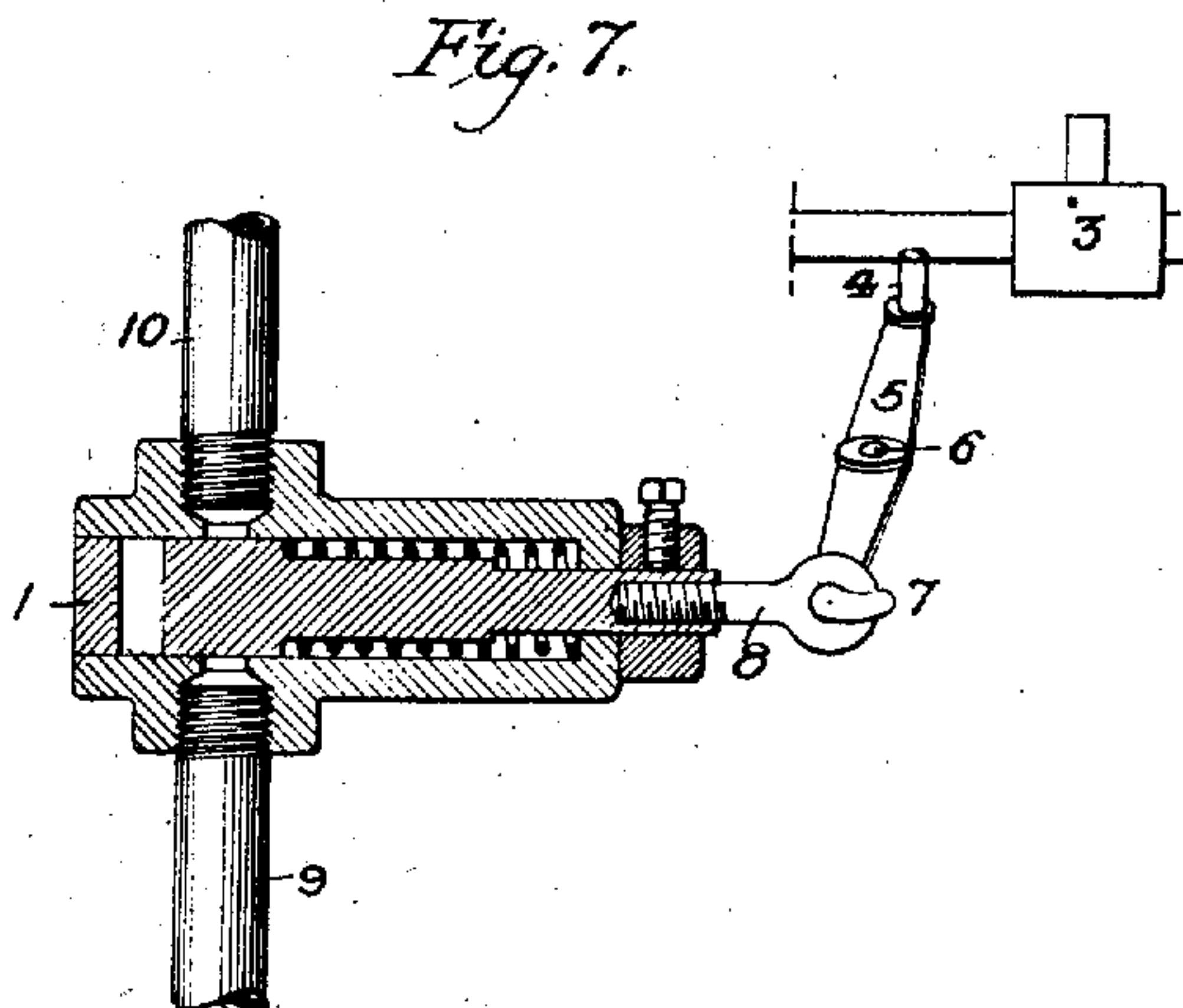


Fig. 7.

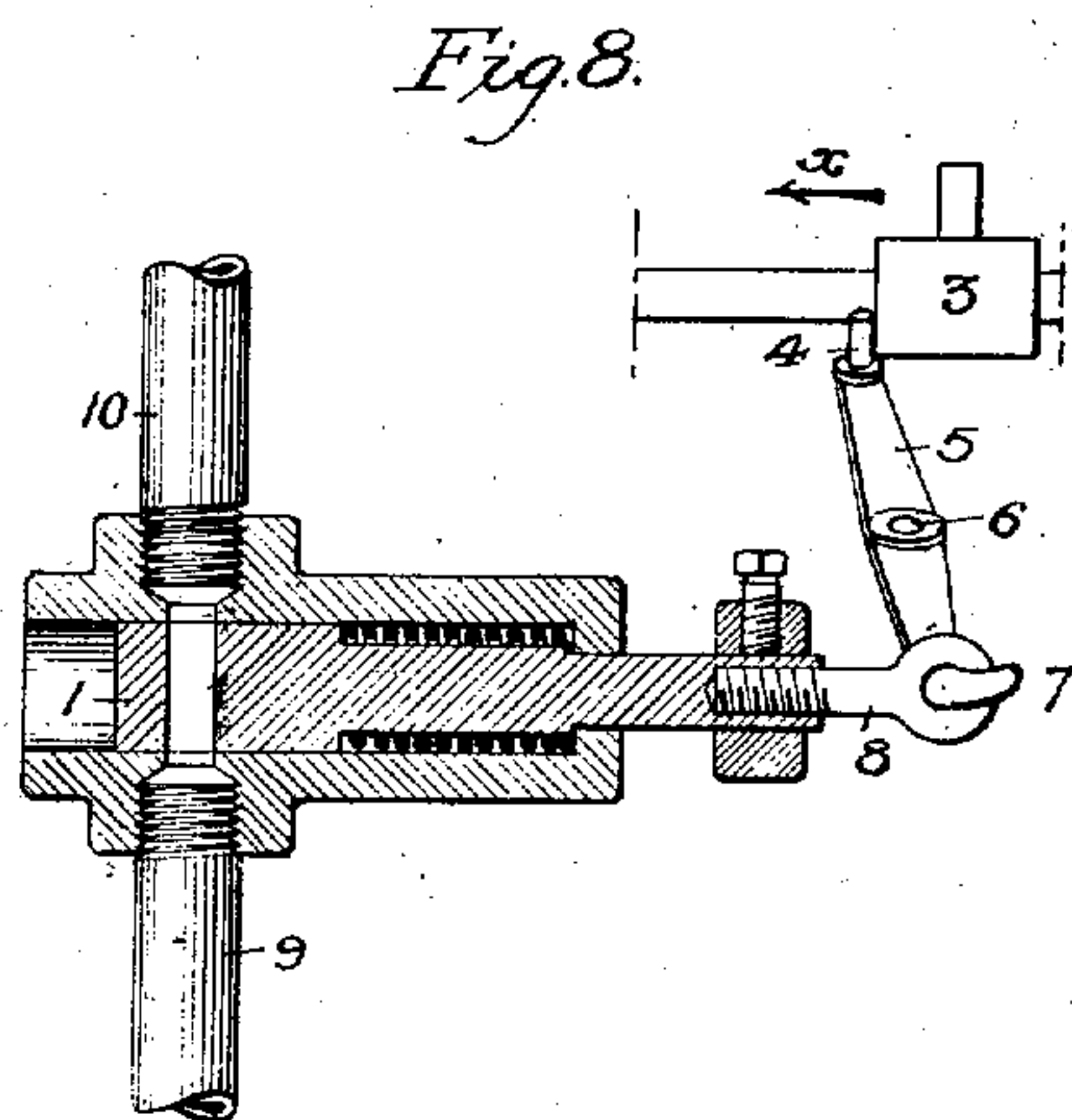


Fig. 8.

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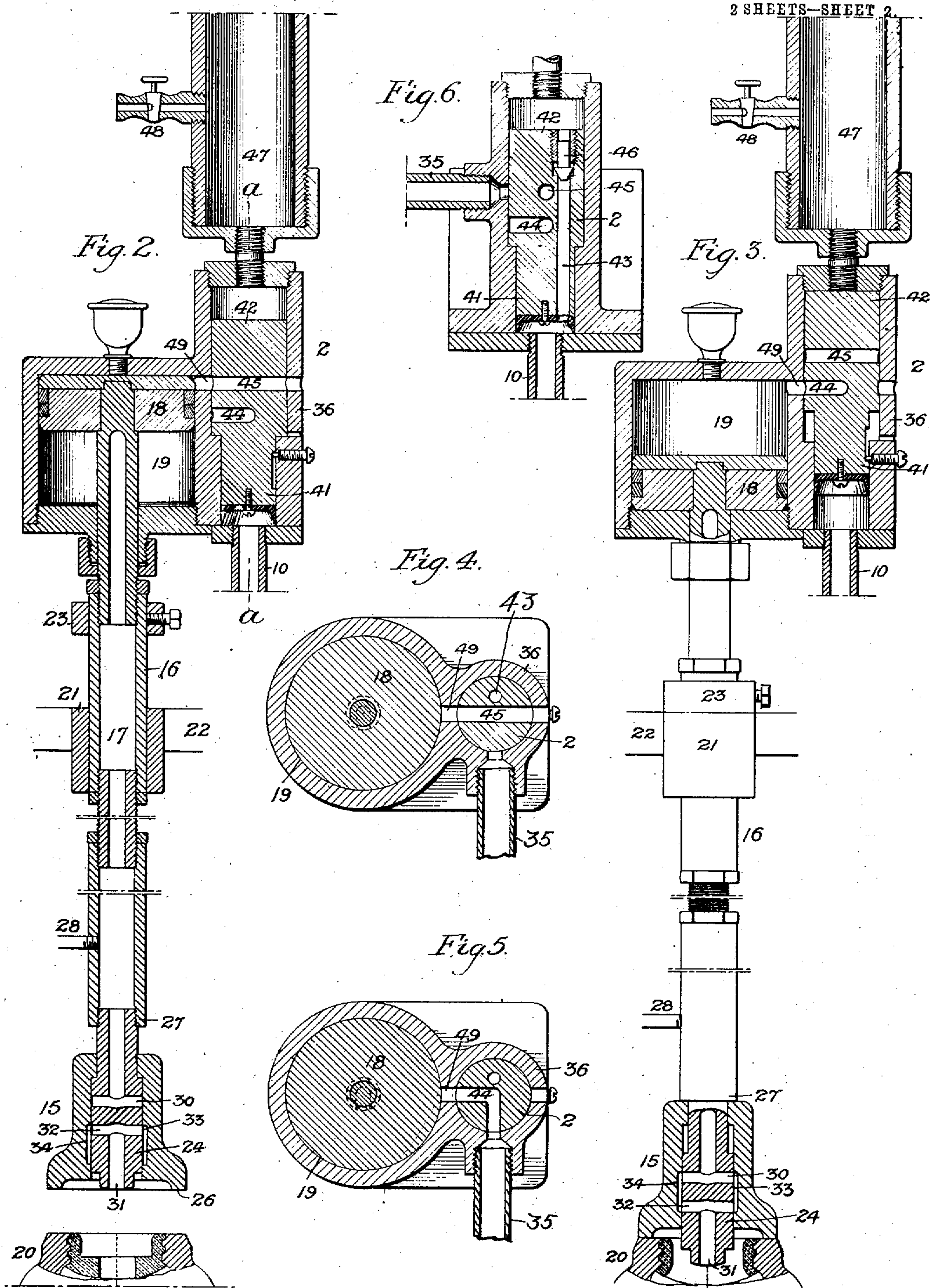
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PATENTED JULY 2, 1907.

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BLOW HEAD FOR GLASS BLOWING MACHINES.

APPLIOATION FILED JUNE 6, 1905.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM DAYTON FREDRICK, OF BRIDGETON, NEW JERSEY, ASSIGNOR TO MILLVILLE MACHINE COMPANY, OF MILLVILLE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BLOW-HEAD FOR GLASS-BLOWING MACHINES.

No. 858,592.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed June 6, 1905. Serial No. 263,979.

To all whom it may concern:

Be it known that I, WILLIAM DAYTON FREDRICK, a citizen of the United States, residing in Bridgeton, Cumberland county, New Jersey, have invented certain Improvements in Blow-Heads for Glass-Blowing Machines, of which the following is a specification.

My invention relates to glass-blowing machines, and consists of an improved blow pipe and blow-head from which pressure is directed to blow the bottle or other article of hollow-ware in process of manufacture, and the mechanism controlling and operating the same.

The blow-head and its operating mechanism forming the subject of my present invention, has been applied to a glass-blowing machine, forming the subject matter of an application filed June 6, 1905, Serial No. 263,978, and the initial means for operating the blow-head controlling mechanism are thrown into action by one of the moving elements of such machine, as will more fully appear hereinafter.

My invention is fully shown in the accompanying drawings, in which:

Figure 1, is a view in elevation of sufficient of a glass blowing machine to show the blow pipe and blow-head and the means for operating the same; Figs. 2 and 3, are sectional views of the blow pipe, blow-head and the valve controlling the movement of the blow-head, showing the latter in the raised and lowered position; Figs. 4 and 5, are sectional views in different positions of the blow-pipe, blow-head, cylinder, piston, and valve controlling the same; Fig. 6, is a sectional view of the valve, taken on the line *a-a*, Fig. 2, and Figs. 7 and 8, are sectional views of the primary controlling valve, showing the same in the closed and open positions.

In operating the blow-head forming the subject of my invention, two main valves 1 and 2, are employed which I have termed the primary and secondary valves, and pressure is admitted to the secondary valve to directly control the position of the blow-head through the primary valve.

The primary valve is shown at 1, in Figs. 1, 7 and 8; the latter figures being in section and illustrating the valve in the closed and open positions.

3 represents a movable member employed in the glass blowing machine with which my improved blow-head is employed, and this member 3 is reciprocated back and forth by suitable means. When it reaches its limit of movement in the direction of the arrow *x*, Fig. 8, it engages a projection 4 at the end of a lever 5, pivotally mounted at 6 and connected at its opposite end 7 to the stem 8 of the valve 1. When the lever is in this position, the valve will be open as indicated in Fig. 8, and fluid under pressure from the pipe 9 is free to pass into the pipe 10 and thence to the secondary valve 2 controlling the position of the piston mounted at the

upper end of the blow-head pipe or stem, and through said piston, the position and action of the blow-head.

The blow-head 15 is supported by a hollow blow-pipe or stem 16 having a central bore 17, and this stem is provided at its upper end with a piston 18, adapted to a cylinder 19 carried by the frame of the machine. The blow-pipe or stem 16 is supported in alinement with the molds 20, when the latter are brought to the blowing position, by means of a bearing 21, carried by a bracket, 22, mounted on the frame of the machine; such rod or stem being provided with a collar 23 to contact with the bearing 21 and limit its downward movement. To the lower end of the blow-pipe or stem a discharge end 24 is connected, which is arranged to enter the neck of the bottle blank or other article within the mold to discharge the air into the same, and carried by this end of the stem, is the blow-head 15 which is practically a valve controlling the discharge of pressure through the end 24 of said stem. By having the discharge end of the blow-pipe below the mouth of the bottle, there is no danger of chilling the pressed portion of the glass by the air entering the glass to blow the same. This blow-head comprises a cupped member having a smooth under surface 26 arranged to engage the upper surface of the mold shell. This head is movable on the end of the blow pipe or stem, being loosely mounted thereon, and acted upon only by the force of gravity. The upward movement of the blow-head is limited by the shoulder 27, and the end 24 is provided with an enlarged portion in which are carried passages for the fluid under pressure, such enlarged portion serving also to limit the downward movement of the blow-head when the latter is lifted from the mold. Communicating with said rod or stem is a tube or hose 28, leading from a source of pressure supply, and this enters the hollow bore of the rod. When the stem is in the lowered position with the blow-head raised by contact with the mold, this fluid under pressure may freely enter the mass of glass within the mold.

The bore 17 of the blow pipe or stem communicates with a cross-passage 30 in the enlarged portion of the discharge end 24, and the lower portion of the discharge end has a central bore 31, communicating with a cross-passage 32, also arranged in the enlarged portion. When the blow-head is in the lowered position, free from the mold, as shown in Fig. 3, the cross-passages 30 and 32 are closed by the internal wall of the same. The blow-head, however, is provided with a chamber 33, formed by an internal annular groove 34 and when the blow-pipe is dropped so as to cause the blow-head to engage a mold, the movement of the blow-head is arrested and the blow pipe or stem continuing on down, the discharge end 24 of the same projects into the bottle blank or other article within the mold and in this new posi-

tion, the cross-passages 30 and 32 are brought into communication with the chamber 33, and the fluid pressure within the bore of the blow-pipe or stem passes through the same, and thence through the bore 31 to the bottle or other blank.

The blow pipe or stem carries at its upper end a piston 18 which I have noted as being within a cylinder 19. This piston is lowered to cause the blow-head to engage the mold by pressure acting upon the upper surface of the same. This pressure is directed to the cylinder from a pipe 35 in which such pressure is constant, but which is cut off from the piston 18 at regular intervals by the action of the secondary valve 2. This valve is mounted in a casing 36 adjacent to the cylinder 19, and pressure for operating this valve is controlled by the primary valve 1 operated at regular intervals by a moving part of the machine as before described.

The valve 2 comprises a cylindrical body, having a reduced portion 41 at the bottom and an enlarged portion 42 at the top and contains the passages 43, 44 and 45. Pressure to move this valve enters through the pipe 10 which communicates with the lower part of the valve casing in line with said valve structure. Within the passage 43 of the valve, which is arranged for the passage of part of the pressure operating the valve, I mount a check valve 46, which is adjustable so as to regulate the amount of initial pressure passing the same. The pressure passing this check valve, which is only a small portion of that acting upon the main valve, enters a cylinder 47, mounted above and in line with the upper chamber of said valve 2 which cylinder is provided with a suitable valve 48 to insure drainage and a complete emptying of pressure contained therein, when said pressure has accomplished the work for which it was intended.

The valve 2 in its new position brings the passage 44 leading to the upper surface of the piston 18, in line with the passage 49 admitting pressure to act on said piston and this pressure lowers the same and with it the blow pipe and blow-head to act upon the bottle blank within the mold. At this time, the valve 1 admitting pressure to the valve 2 controlling this piston 18 has been cut off, and this latter valve is ready to be moved to the lower position. This is accomplished by the pressure within the cylinder 47 acting upon the upper surface of the valve 2, and by reason of the greater area of this surface, such pressure overcomes the greater pressure on the under surface and thereby insures the dropping of the valve. When this is done, the exhaust passage 45 of said valve is brought opposite the inlet 49 to the cylinder, and the pressure above the piston is permitted to exhaust, whereupon the pressure for effecting the blowing action entering hollow bore 17 of the blow-pipe or stem through the tube or hose 28, acts upon the upper end of the bore of said blow pipe or stem and raises the piston to the initial position.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. The combination of a blow-pipe arranged to deliver fluid under pressure, fluid operated means for lowering said blow-pipe, means for directing an independent supply of fluid under pressure to said blow-pipe, such pressure serving to raise said blow-pipe when the pressure tending to lower the same is cut off, a discharge outlet carried by said blow-pipe and extending into the neck of the article to be blown below the mouth of the same, and

means for placing said discharge outlet in communication with the blow-pipe when the latter is lowered and automatically cutting off such communication when the blow-pipe is raised.

2. The combination of a blow-pipe arranged to deliver fluid under pressure, fluid operated means for lowering said blow-pipe, means for directing an independent supply of fluid under pressure to said blow-pipe, such pressure serving to raise said blow-pipe when the pressure tending to lower the same is cut off, a discharge outlet formed integral and in line with said blow-pipe and extending into the neck of the article to be blown below the mouth of the same, and means for placing said discharge outlet in communication with the blow-pipe when the latter is lowered and automatically cutting off such communication when the blow-pipe is raised.

3. The combination of a blow-pipe arranged to deliver fluid under pressure, fluid operated means for lowering said blow-pipe, means for directing an independent supply of fluid under pressure to said blow-pipe, such pressure serving to raise said blow-pipe when the pressure tending to lower the same is cut off, a discharge outlet carried by said blow-pipe and extending into the neck of the article to be blown below the mouth of the same, said blow-pipe having a pair of cross-passages adjacent said discharge outlet, and a blow-head serving normally as a cut-off valve for said blow-pipe and automatically placing said cross-passages in communication with the blow-pipe and its discharge outlet when said blow-pipe is lowered.

4. The combination of a blow-pipe arranged to deliver fluid under pressure, fluid operated means for lowering said blow-pipe, means for directing an independent supply of fluid under pressure to said blow-pipe, such pressure serving to raise said blow-pipe when the pressure tending to lower the same is cut off, a discharge outlet formed integral and in line with said blow-pipe and extending into the neck of the article to be blown below the mouth of the same, said blow-pipe having a pair of cross-passages adjacent said discharge outlet, and a blow-head serving normally as a cut-off valve for said blow-pipe and automatically placing said cross-passages in communication with the blow-pipe and its discharge outlet when said blow-pipe is lowered.

5. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, a piston carried by said pipe, a cylinder in which said piston is mounted, means for directing fluid under pressure to lower said piston and bring the blow-head into the operative position, and means for delivering an independent supply of fluid pressure to the blow-pipe.

6. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, a piston carried by said pipe, a cylinder in which said piston is mounted, means for lowering said piston to bring the blow-head into the operative position, and means for delivering a supply of fluid under pressure to the blow-pipe, such pressure serving also to raise the piston when the force for lowering the same is relieved.

7. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, a piston carried by said blow-pipe, a cylinder in which said piston is mounted, means for directing fluid pressure to lower said piston, and means for delivering an independent supply of fluid pressure to the blow-head.

8. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, a piston carried by said blow-pipe, the bore of the latter leading to the piston, a cylinder in which said piston is mounted, means for directing fluid under pressure to lower said piston, and means for delivering an independent supply of fluid under pressure to the blow-head, such pressure acting on the piston to raise the same when the force tending to lower the same is relieved.

9. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, the latter serving also as a cut-off valve, a piston carried by the upper end of said blow-pipe, a cylinder in which said piston is mounted, means for lowering the piston by fluid under pressure, a valve controlling the same, and means for delivering an independent and constant supply of fluid un-

- der pressure to the blow-pipe and blow-head, said pressure serving to raise the piston when the pressure for lowering the piston is cut off.
10. The combination of a blow-pipe and blow-head for use in blowing articles of hollow-ware, the latter serving also as a cut-off valve, a piston carried by the upper end of said blow-pipe, a cylinder in which said piston is mounted, means for lowering the piston by fluid under pressure, a valve controlling the same, and means for delivering a constant supply of fluid under pressure to the blow-pipe, and means for causing such pressure to raise the piston when the pressure for lowering the piston is cut off.
11. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, a cylinder in which said piston is mounted, means for lowering said piston, means for supplying the blow-pipe with fluid under pressure, a blow-head through which such pressure passes at intervals, and means for causing such pressure to raise the piston and lift the blow-head from its work.
12. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, a cylinder in which said piston is mounted, means for directing fluid under pressure to lower said piston, independent means for supplying the blow-pipe with fluid under pressure, a blow-head through which such pressure passes at intervals, and means for causing such independent pressure to raise the piston and lift the blow-head from its work.
13. The combination of a blow-pipe and blow-head, means for lowering the same, a valve controlling the means to effect such action, means for directing fluid pressure to operate such valve, and means for controlling the passage of such fluid pressure.
14. The combination of a blow-pipe and blow-head, a cylinder, a piston disposed therein and connected to the blow-head, means for lowering said piston, a valve controlling the means to effect such action, means for directing fluid pressure to operate such valve, and means controlling the passage of such fluid pressure.
15. The combination of a blow-pipe and blow-head, means for directing fluid pressure to lower the same, a valve controlling the passage of pressure to effect such action, means for directing fluid under pressure to operate such valve, and means for controlling the passage of such fluid pressure.
16. The combination of a blow-pipe, and blow-head, means for directing fluid under pressure to lower the same, a valve controlling the passage of such pressure to effect such action, means for operating said valve by fluid under pressure, a valve for controlling the passage of fluid under pressure to the first named valve, and means for operating said latter valve.
17. The combination of a blow-pipe and blow-head, means for directing fluid under pressure to lower the same, a valve controlling such pressure and operated thereby, and means controlling the passage of pressure to said valve.
18. The combination of a blow-pipe and blow-head, means for lowering the same, a valve controlling such movement, means for directing fluid under pressure to operate said valve, another valve controlling the passage of pressure to the first-named valve, and means for operating said second valve.
19. The combination of a blow-pipe and blow-head, means for lowering the same, a valve controlling the means for effecting such movement, means for directing fluid under pressure to operate said valve, and a valve controlling the passage of such pressure to the operating valve.
20. The combination of a blow-pipe and blow-head, a cylinder, a piston therein connected to the blow-pipe, a valve controlling fluid under pressure for lowering said piston, means for directing fluid under pressure to operate said valve, and a second valve for controlling the passage of such pressure to the operating valve.
21. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, means for controlling the position of said piston including a valve controlled by and serving to direct pressure for lowering the piston, an auxiliary cylinder mounted above said valve and receiving the pressure acting upon said valve, the latter being so constructed as to pass a portion of its operating pressure to said cylinder, and means for exhausting pressure from said cylinder.
22. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, means for controlling the position of said piston including a valve controlled by and serving to direct pressure for lowering the piston, an auxiliary cylinder mounted above said valve, means within said valve for passing its operating pressure to said cylinder, and means for exhausting such pressure from the cylinder, said valve having a greater area at its top whereby the pressure from said cylinder will serve to lower the valve when the flow of pressure to its under side has been cut off.
23. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, a valve for directing pressure to lower said piston, means for directing pressure to act upon said valve, an auxiliary cylinder mounted above the same, said valve having a through opening for passing its operating pressure to said cylinder, a check valve mounted in said opening, and means for exhausting such pressure from the cylinder to lower the piston controlling valve.
24. The combination of a blow-pipe and blow-head, a cylinder, a piston carried by said blow-pipe and disposed in said cylinder, a valve controlling the position of said piston, means for directing pressure to act upon said valve, an auxiliary cylinder mounted above said valve, said valve having a through opening for passing a portion of its operating pressure to said cylinder, a check valve mounted in said opening, and means for exhausting such pressure from the cylinder, said valve having a greater area at its top whereby the pressure from said auxiliary cylinder will serve to lower the valve when the flow of pressure to its under side has been cut off.
25. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, means for lowering said piston, a valve controlling such means, means for directing pressure to act on said valve, a valve controlling the passage of such pressure, and means for operating said valve.
26. The combination of a blow-pipe and blow-head, a cylinder, a piston carried by said blow-pipe and disposed in said cylinder, means for lowering said piston, a valve controlling such means, means for directing pressure to act on said valve, a valve controlling the passage of such pressure, and an auxiliary cylinder receiving pressure to lower said valve.
27. The combination of a blow-pipe and blow-head, a piston carried by said blow-pipe, means for directing pressure to said piston to lower the same, a valve controlling the passage of such pressure to the piston, an independent source of pressure to operate said valve, a second valve controlling such independent source of pressure, and means for operating said valve.
28. The combination of a blow-pipe and a blow-head movable in unison, a fluid pressure device for controlling the movement of said blow-head and blow-pipe, a secondary valve controlling said fluid pressure device, and a primary valve for controlling the position of the secondary valve by fluid pressure.
29. The combination of a blow-mold, a blow-pipe and blow-head for engagement with said mold to blow the glass within the same, a valve controlling the lowering of said blow-head, and fluid pressure means for actuating said valve.
30. The combination of a mold, a blow-pipe and blow-head adapted for engagement therewith, a valve controlling the movement of the blow-pipe and blow-head toward the mold, and fluid pressure means for actuating said valve.
31. The combination of a mold, a blow-pipe and blow-head adapted for engagement therewith, a valve controlling the movement of said blow-pipe and blow-head in one direction, fluid pressure means for actuating said valve, and independent fluid pressure means for raising said blow-pipe and blow-head and serving to blow the glass when said blow-head is lowered.
32. The combination of a blow-mold, a blow-pipe and

blow-head adapted for engagement therewith, a valve controlling pressure to effect the downward movement of said blow-pipe and blow-head, fluid-pressure means for actuating said valve, and independent fluid pressure means for raising said blow-head and serving to blow the glass when said blow-head is lowered.

33. The combination of a blow-mold, a blow-pipe and blow-head adapted for engagement therewith, a valve controlling the movement of the blow-pipe and blow-head toward the blow-mold, means for actuating said valve, and means for delivering an independent supply of fluid

pressure to the blow-head for passage to the material within the mold, said pressure serving when the valve controlling the downward passage of the blow-head is shifted to raise said blow-head.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM DAYTON FREDRICK.

Witnesses:

ORESTES COOK,

HARRY L. WOODRUFF.