No. 631,195. Patented Aug. 15, 1899.

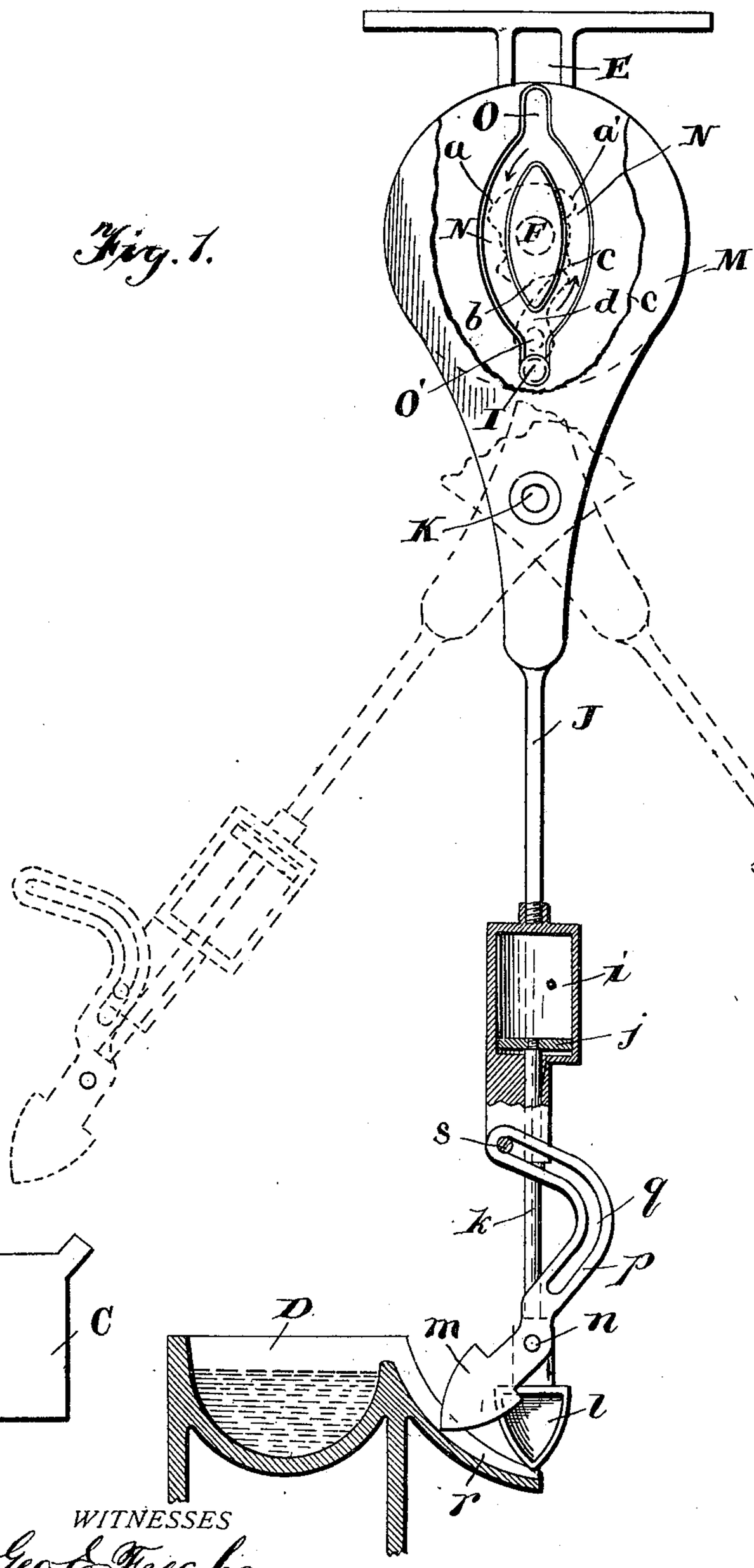
C. E. BLUE.

GLASS DIPPING MACHINE.

(Application filed Oct. 9, 1897.)

(No Model.) 2 Sheets—Sheet 1

Fig. 1.



WITNESSES

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Fig. 2.

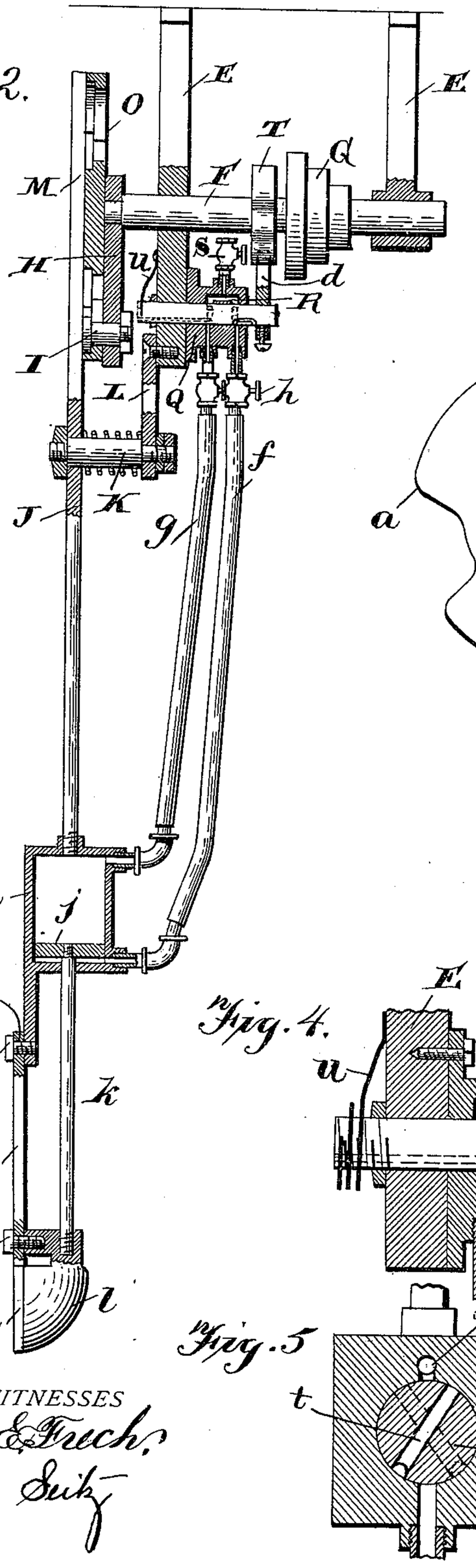

Fig. 3.

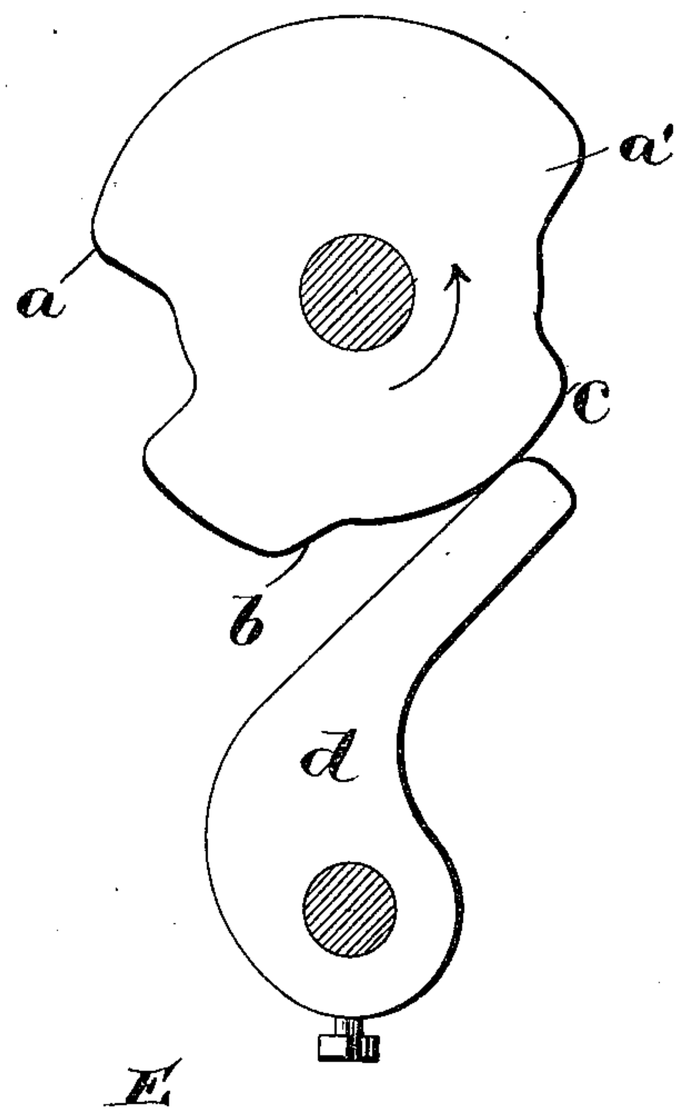

Fig. 4.

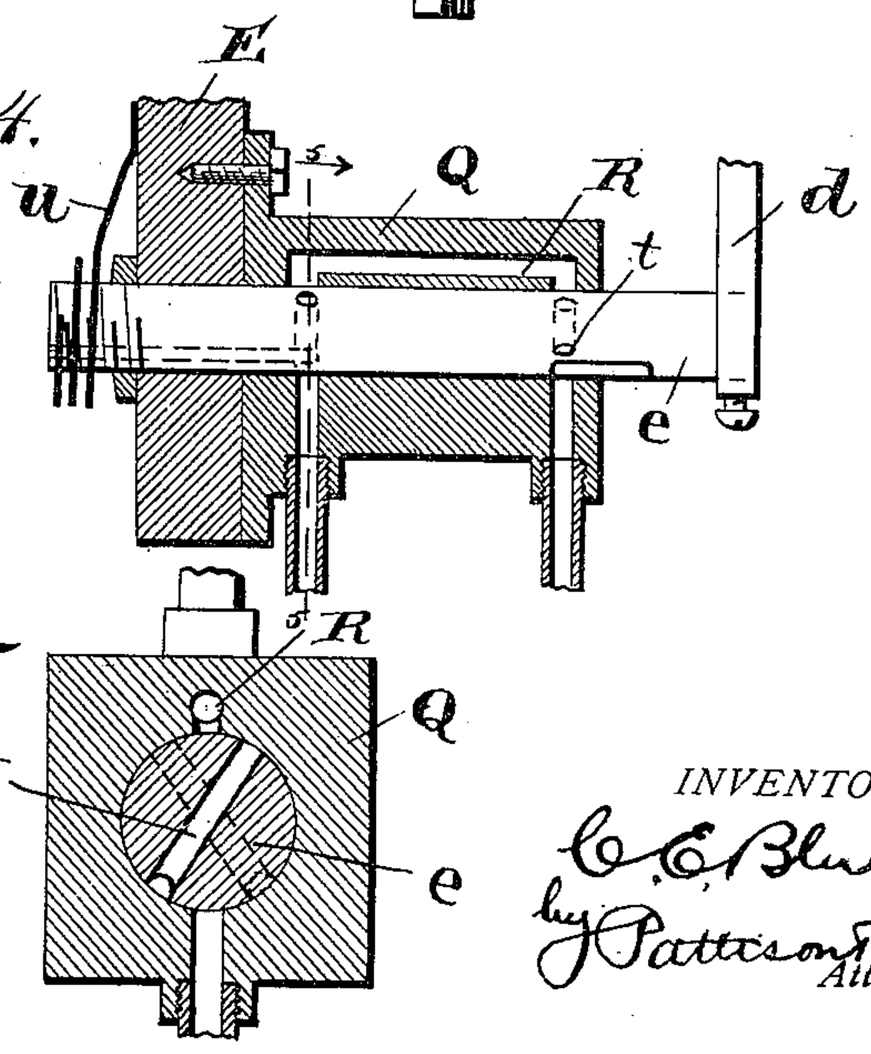

Fig. 5

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UNITED STATES PATENT OFFICE.

CHARLES EDWIN BLUE, OF WHEELING, WEST VIRGINIA, ASSIGNOR OF ONE-HALF TO ARTHUR G. HUBBARD AND LOUIS V. BLUE, OF SAME PLACE.

GLASS-DIPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,195, dated August 15, 1899.

Application filed October 9, 1897. Serial No. 654,674. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EDWIN BLUE, of Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Glass-Dipping Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in glass-dipping machines, the object of which is to provide a mechanism adapted to take a charge or quantity of glass at one point and to automatically deliver it at another point.

In the accompanying drawings, Figure 1 is a front elevation of a glass-dipping machine embodying my invention, the operating lever or pendulum shown in a vertical position in full lines and in its opposite positions in dotted lines. Fig. 2 is a vertical sectional view of Fig. 1. Fig. 3 is an enlarged detail view of the cam operating the air-controlling valve through the medium of an arm or lever. Figs. 4, 5, and 6 are detail views of the air-controlling valve.

Referring now to the drawings, A indicates the glass-mold or other point at which it is desired to deliver a quantity of glass; B, a funnel situated thereabove; C, a glass-pot containing a quantity of molten glass, and D a water-tank adapted to receive the ladle or glass-carrying receptacle and cool the same after it has delivered the glass to the desired point.

E are hangers or supports, F a driving-shaft, and G a cone-pulley receiving its power through a belt from any desired source. It will be readily understood that means other than a belt and pulley may be provided for driving the shaft F without departing from my invention. Attached to one end of the driving-shaft F is a crank H, carrying at its outer end a roller or wrist-pin I.

J is a lever or pendulum carrying at its upper end a disk M, said lever or pendulum being intermediately pivoted and supported upon a bolt K, supported by a hanger L. The disk M is provided at opposite sides of its center with arc-shaped grooves N, said grooves being united by means of the upwardly and downwardly projecting recesses O and O′, respectively.

Carried upon the lower end of the lever or pendulum J is a cylinder *i*, containing the piston *j*, to which is connected a piston-rod *k*, carrying at its lower end a glass-ladle or other receptacle *l*. *m* is a cover adapted to close the said ladle, pivoted at the point *n* and having connected therewith a curved arm *p*, having a correspondingly-curved or cam slot *q*, which receives a pin or screw *s*, carried by the cylinder *i*.

Secured to the driving-shaft F is a cam T, provided with the cam-surfaces *a*, *b*, and *c*, the function and operation of which will be fully described hereinafter. Attached to one of the hangers or supports E is a casting Q, through which passes a valve *e*, the casting having a chamber or recess R, adapted to register with air-passages *t*, made in the said valve E. Connected with the casting are the pipes *f* and *g*, which communicate, respectively, with the upper and lower ends of the cylinder *i* above and below the piston-head *j*, the upper ends of these flexible pipes being in communication with the air-chamber R of the casting through the passages of the said valve *e*. Attached to the valve *e* is a lever or arm *d*, adapted to be engaged and operated by the cam-surfaces *a*, *b*, and *c* in a manner to be hereinafter set forth. Attached to the valve *e* is a spring *u*, of any desired form, constructed to cause the free end of the arm or lever *d* to be in constant engagement with the cam T as it revolves, the said cam serving to force the arm outward and the spring to hold it in engagement therewith.

The piston-head *j*, carrying the ladle *l*, is adapted to be moved up and down by means of air-pressure, which is fed to the chamber R of the casting Q through the communication S from any desired source. When ladle or receptacle *l* is drawn upward, the cover *m* is moved over and closes the ladle or receptacle through the medium of the cam or curved slotted arm *p* and the stud or screw *s*, and

when the ladle is lowered the cover is removed therefrom, both movements being clearly illustrated in Fig. 1.

The device is adapted to take a quantity of molten glass from one point and deliver it to another point—for instance, as illustrated in Fig. 1, to take from the glass-pot C a quantity of glass, carry it over the mold A, deliver the glass within the mold, in moving backward to pass into the water-tank D and be cooled, and thence to the glass-pot for again being charged. When the ladle or receptacle is over the glass-pot C, it is carried down within the glass, and its downward movement causes the removal of the cover of the ladle when the ladle becomes filled, and moving upward again it closes, the said receptacle thus being removed from the glass-pot filled with glass. The ladle then remains in this upward closed position until it arrives over the mold, as shown in Fig. 1, when the ladle is moved downward, and in its downward movement causes the cover to be removed and deliver the glass to the mold, as will be readily understood. Carrying these steps in mind, the operation of my invention is as follows: Taking the position shown in solid lines in Fig. 1, with the ladle down and the arm D engaged by the cam-surface *c*, both of the air-passages to the cylinder *i* are closed. The wrist-pin or roller I is within the lower recess O', and as the crank H revolves in the direction indicated by arrow the ladle is carried to the left. In moving to the left it engages the incline *r* of the water-tank and is moved upward and drops within the water and passes therethrough, and just before it reaches the opposite wall of the water-tank the cam *b* engages the arm *d*, thus actuating the valve, and opens the air-passage to the lower part of the cylinder, thus elevating the ladle or receptacle. The lever or pendulum J continues to move to the left to about the point shown in dotted lines, at which point the disk M has become sufficiently tilted to cause the roller or pin I to pass out of the recess O' and into the arc-shaped grooves N at the right of the disk M. The pendulum then ceases its lateral movement, owing to the fact that the pin or roller moves in the arc-shaped grooves, thus holding the ladle in this position until the pin or roller reaches the recess O at the top of the disk M. While the roller is passing from the recess O' at the bottom of the disk M to the recess O at the top thereof the arm *d* is actuated by the cam-surfaces of the cam T to cause the admission of air at the top of the cylinder *i*, forcing the ladle downward in the glass-pot, and then to remove it immediately therefrom by the quick and successive movements of the arm *d* through the medium of the cam-surfaces *b* and *a*. The movement of the ladle within the glass opens it, as before described, and the movement of the ladle therefrom closes it, as before described, so that the ladle is removed from the glass-pot filled with glass and the arm *d* is then upon the long cam *a*. At this point, as before stated, the roller I has reached the upper recess O of the disk M, and in passing within the said recess the pendulum or lever J is moved in the opposite direction and passes over to the position shown in dotted lines at the right of Fig. 1. When it reaches this position, the arm *d* has reached the opposite end *a'* of the cam *a* and the arm is permitted to be drawn in by the spring, and in being drawn inward air is admitted to the top of the cylinder *i* and the ladle moved downward over the mold, and in its downward movement the cover is removed therefrom and the glass deposited within the mold. The downward movement of the ladle at the right-hand side is accomplished while the pin I is in the arc-shaped groove at the left side of the cam M and before it reaches the recess O' at the bottom thereof. When it reaches this point, the ladle is reciprocated in the opposite direction and passes through the water-tank, as before described. This operation is repeated, the glass being taken from one point and delivered at another, as will be readily understood from the above description.

The cam-surfaces of the cam T and the air-passages in the valve E are so situated that air is admitted and cut off from the upper and lower portions of the cylinder I at the proper time to accomplish the operation herein described.

The apparatus subjects the ladle to a cooling agent after discharging and before the charging thereof, and this is very essential, for otherwise the glass would adhere to the ladle and make it practically inoperative for the purpose described. I do not, therefore, limit myself to the particular mechanism herein shown for accomplishing this end, for this may be varied and changed without departing from the spirit and scope of the claims to this part of my invention.

I do not limit myself to the exact constructions shown, for these may be varied without departing from the spirit and scope of my claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A machine of the character described, comprising a supply vessel, a receiving vessel, a ladle-carrier, a ladle carried thereby, a driving member for said carrier, and means controlled and actuated by said driving member and constructed and arranged to move the ladle-carrier from one vessel to the other and to dip and discharge said ladle respectively in respect to said vessels.

2. A machine of the character described, comprising a supply vessel, a receiving vessel, a laterally-movable ladle-carrier, a ladle carried thereby and longitudinally movable in respect thereto, a driving member for said carrier, and means actuated and controlled by the driving member and constructed and arranged to move said carrier from one vessel

to the other, and to lower and raise said ladle in respect to the carrier and vessels when adjacent the latter.

3. A mechanism of the character described comprising a supply and a receiving vessel, a vertical pendulum-lever pivotally supported at a point between and above said vessels, a mechanism situated at the upper end of said lever and constructed to vibrate it, a ladle carried by the lower end of the lever and longitudinally movable in respect thereto, and means constructed and arranged to raise and lower said ladle when it is over said vessels.

4. A mechanism of the character described comprising a supply and a receiving vessel, a vertical pendulum-lever intermediately pivoted at a point between and above said vessels, a mechanism engaging said lever above its pivotal point, and constructed to vibrate said lever, a ladle carried by and longitudinally movable in respect to said lever, and means constructed and arranged to raise and lower said ladle when said lever is at the limit of its movement in either direction.

5. A mechanism of the character described comprising a glass pot or receptacle, a receiver for the glass, a water-tank situated between the said glass-receptacle and the receiver, a laterally and longitudinally movable glass carrier or receptacle, and actuating members arranged and constructed to carry said receptacle over within and without the glass-pot, over the receiver and downward in respect thereto, and thence within the water-tank, substantially as described.

6. A mechanism of the character described comprising a glass receptacle or holder, a receiver, a water-tank situated therebetween, a laterally and longitudinally movable glass-carrying receptacle, means for moving the glass-receptacle laterally and longitudinally for the purpose described, said water-tank having an incline for elevating the glass-carrier above its wall, the parts combined substantially as described.

7. A machine of the character described comprising a laterally-movable receptacle-carrier, a member for moving the said carrier laterally, a glass-carrier carried by the said carrier and movable longitudinally in respect thereto, means for moving said glass-carrier, a cover for said glass-carrier, and means arranged and constructed to actuate the said cover through the movements of the said carrier, substantially as described.

8. A machine of the character described comprising a glass-carrier, means constructed and arranged to move the carrier vertically and laterally, a dipping-receptacle carried thereby and having a filling-opening, a cover for said filling-opening, a supply vessel, and means constructed and arranged to open and close the filling-opening respectively when the receptacle is dipped and removed from the supply vessel for discharging, substantially as described.

9. A machine of the character described comprising a vibrating lever or pendulum intermediately pivoted, a receptacle carried at one end of the pendulum, the opposite end having arc-shaped grooves connected by laterally-extending recesses, a rotating member movable within the said arc-shaped grooves and recesses, whereby the lever is moved laterally and held for a time at its limit of movement, substantially as described.

10. A mechanism of the character described comprising a supply or glass vessel, a receiving vessel or mold, a dipping-receptacle having an inlet and exit opening, means constructed and arranged to dip said dipping-receptacle in the supply vessel, remove it therefrom and carry it to the receiving vessel, and means constructed and arranged to close said inlet when the receptacle is dipped, and to open said exit when the receptacle is at the receiving vessel.

11. A machine of the character described comprising a vibrating lever intermediately pivoted, a movable receptacle carried at one end thereof, the opposite end of the lever having a disk with arc-shaped grooves and laterally-extending recesses, a crank carrying a wrist-pin or roller engaging the said grooves and recesses, substantially as described.

12. A machine of the character described comprising a vibrating lever having at one end a cylinder, a piston therein carrying a piston-rod, a receptacle carried by the said piston-rod, means for vibrating the lever, a fluid or air pressure supply arranged in communication with opposite ends of the cylinder, a controller for said communication, substantially as described.

13. A machine of the character described comprising a vibrating lever, a cylinder carried at one end thereof, a piston-head within the cylinder, a piston-rod, a receptacle carried by the piston-rod, means for vibrating the lever and holding it at its limit of movement, an air or fluid pressure supply arranged in communication with the opposite ends of said cylinder, a controller for said communication, and a cam constructed and arranged to actuate said controller for admitting pressure from said supply to opposite ends of the cylinder when the lever is at its limit of movement, substantially as described.

14. A machine of the character described comprising a receptacle-carrier, a receptacle movable thereon, an operating element for said carrier, and a movable actuating member for said receptacle which is controlled by the carrier-actuating element, substantially as described.

15. A machine of the character described comprising a receptacle-carrier, an operating-shaft therefor, a cam carried by said shaft, a receptacle carried by and movable in respect to said carrier, and an actuating member for said receptacle controlled by said cam, substantially as described.

16. A machine of the character described comprising a vibrating receptacle-carrier, an

actuating member for vibrating said carrier, a receptacle carried by and movable in respect to said carrier, and a movable cam having two cam-surfaces arranged and constructed to control the movements of said receptacle, substantially as described.

17. A machine of the character described comprising a vibrating receptacle-carrier, an actuating member therefor, a receptacle carried by and movable in respect thereto, and a movable cam having a long and a short cam-surface arranged and constructed to control the movements of said receptacle, substantially as described.

18. In an apparatus of the character described, a supply vessel, a receiving vessel, a ladle, means for moving the ladle from one vessel to the other, a ladle-cooling means, and means controlled by the ladle-moving means for bringing the ladle into operative contact with the cooling means during its movement from one vessel to the other, substantially as described.

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

CHARLES EDWIN BLUE.

Witnesses:
NELSON C. HUBBARD,
BRADY SMITH.