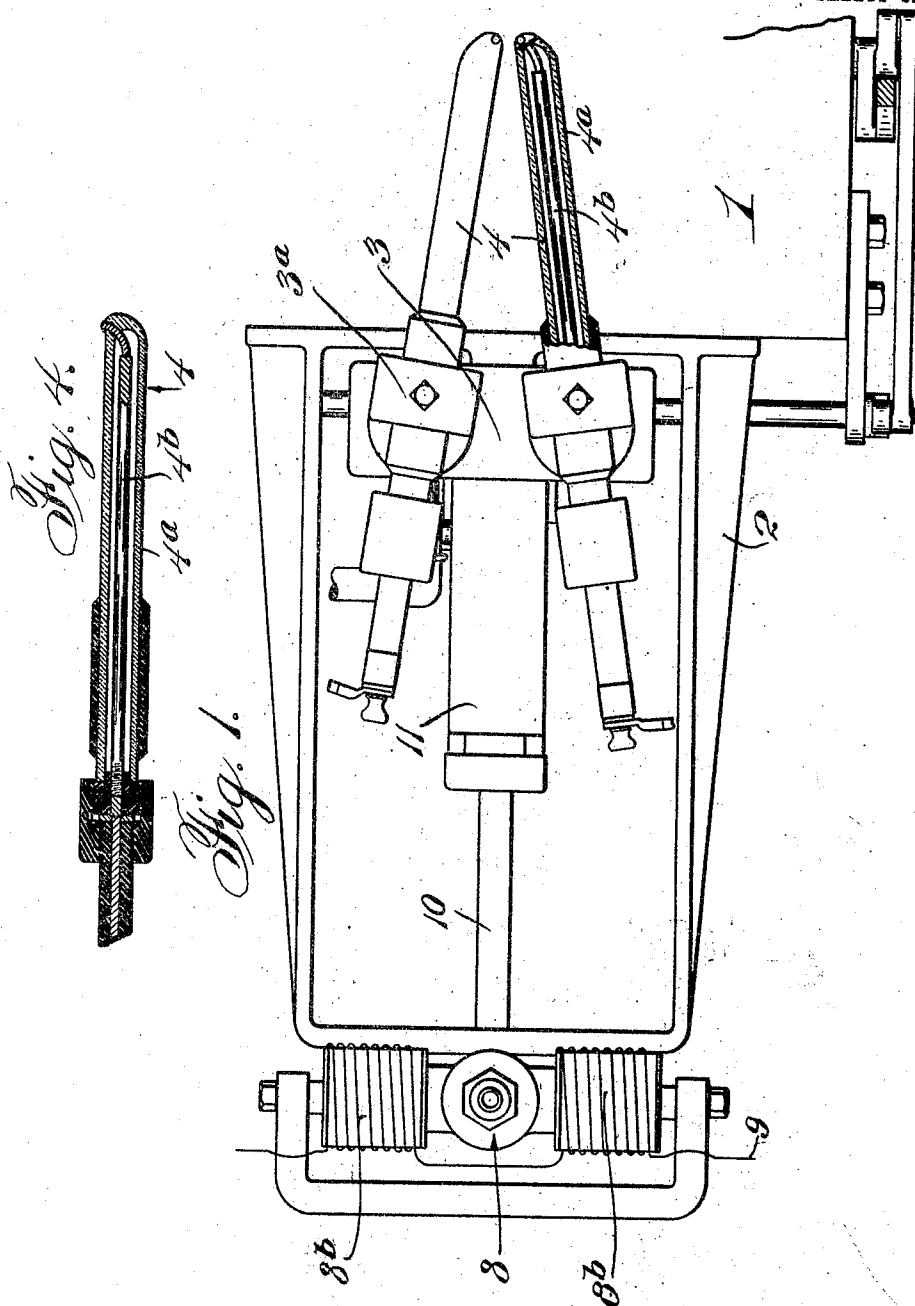


O. A. HANFORD.
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 APPLICATION FILED AUG. 1, 1910.
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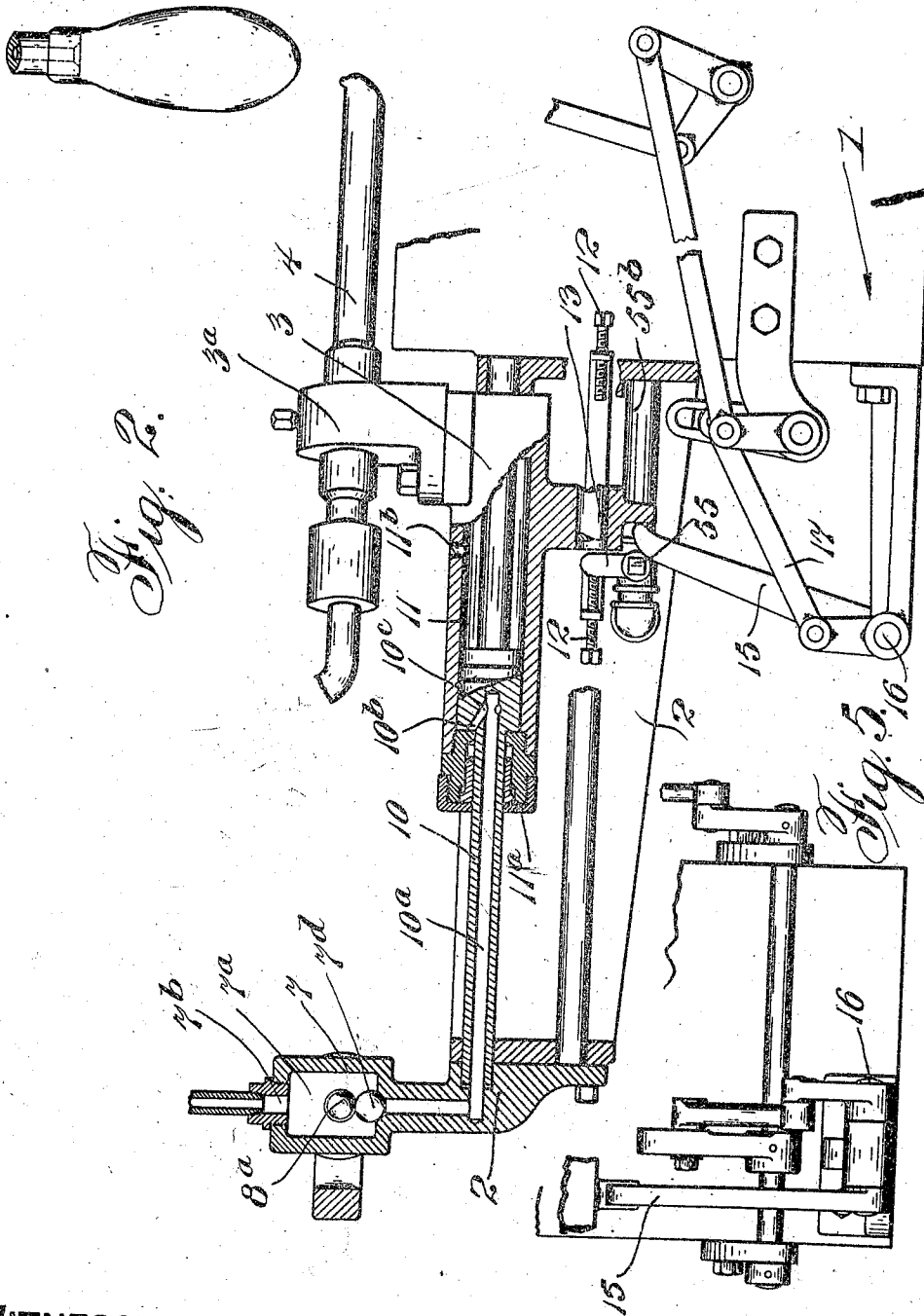


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INVENTOR:

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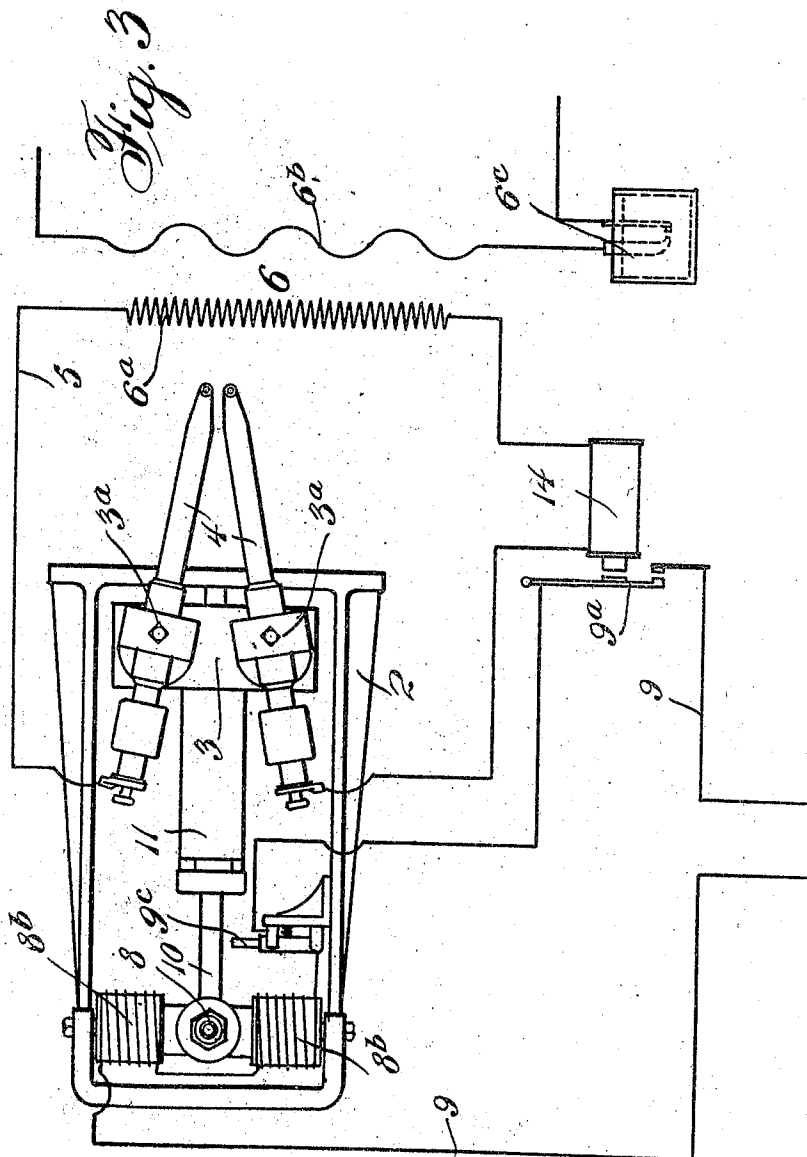
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UNITED STATES PATENT OFFICE.

ORIN A. HANFORD, OF ROCHESTER, NEW YORK, ASSIGNOR TO EMPIRE MACHINE COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

GATHER-ACTUATED CONTROLLER FOR GLASS-BLOWING MACHINES.

1,066,270.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed August 1, 1910. Serial No. 574,922.

To all whom it may concern:

Be it known that I, ORIN A. HANFORD, a citizen of the United States of America, and a resident of Rochester, New York, have invented certain new and useful Improvements in Gather-Actuated Controllers for Glass-Blowing Machines, of which the following is a specification.

In another application filed by me on Feb. 17, 1912, serially numbered 678,231, I have shown and described a glass blowing machine adapted to receive a removable blow-pipe and after performing certain operations preliminary to blowing, to come to rest and provided with an automatic controller in the form of a thermal element, which upon the elongation of the gather to the proper extent, restarts the machine for the purposes of blowing, molding and the subsequent operations.

My present invention relates to another form of automatic controller and one whose action is due to the fact that the descending gather at the proper time forms a part of an electrical circuit by which the subsequent operations of the machine are controlled. The circuit, in the form shown, is completed by a spark jumping between the electrodes and the gather, as the electrodes cannot come in contact with the glass without injuring the bulb blown, and the circuit is therefore one of high tension. In order to permit the energy in this circuit to be as small as possible, it is in effect only a pilot circuit which controls an electric contact maker in the circuit of an air valve, such as described in my other application.

My invention consists further in the construction, arrangement, combination of the several parts of which it is composed as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings in which corresponding parts are designated by corresponding marks of reference: Figure 1 is a plan view of an automatic controller constructed in accordance with this invention. Fig. 2 is an elevation partly in section thereof. Fig. 3 is a diagrammatic view showing the wiring of the controller. Fig. 4 is a detail view of one of the electrodes. Fig. 5 is a detail of resetting mechanism.

Mounted on the mold tank 1 of a proper glass blowing machine is a forwardly ex-

tending bracket 2 on which is guided a sliding frame 3, suitable heads 3^a being formed upon the top of the frame to receive the electrodes 4. Each of these electrodes comprises an insulating tube 4^a in which is inclosed a conductor 4^b, the ends of the conductor projecting through the end of the tube. The ends of the two tubes approach each other and are separated by an air gap, which when the sliding frame is in its normal position is in the path of the descending gather A or in proximity thereto. The conductors 4^b form part of the high tension circuit 5 which contains the secondary 6^a of transformer 6, the primary 6^b of which is in circuit with a suitable interrupter 6^c whereby a high tension alternating current will be set up in the circuit 5 when the resistance between the conductors 4^b of the electrode is sufficiently reduced to permit the spark to jump from one to the other. This occurs when the descending gather is in close proximity to the electrodes, at which time the gather completes the path of the spark. On the forward end of the bracket is contained an air valve 7 comprising a valve chamber 7^a, inlet and outlet ports 7^b and 7^c respectively, and a ball valve 7^d for the latter. The two poles 8^a of an electro-magnet 8 project into the valve chamber above the ball valve, the said magnet being energized by coils 8^b, whose circuit 9 includes a suitable source of current (not shown), an electrically actuated contact maker in the form of an armature 9^a and a mechanically actuated circuit breaker 9^b having a spring pressed movable member 9^c, the end of which projects into the path of the movable frame. An electro-magnet 14 is included in the circuit of a secondary 6^a of the transformer, and on the high tension current flowing through such circuit, such electro-magnet is energized to lift the armature 9^a to close the circuit 9, thereby energizing the magnet 8 and lifting the valve ball 7^d.

The outlet port 7^c communicates with the central bore 10^a of a tubular piston 10 rigidly mounted in the bracket 2, the rear end of which piston has communication through a port 10^b to the forward side of the piston head 10^c, which latter is contained within the cylinder 11 forming part of the sliding head 3 and having a closed forward end 11^a. The sliding head 3 is provided with two adjustable striking pins 12 which actuate the

arm 13 of an air valve 55 interposed in the pipe 55^b, the air pressure transmitted through which, acting upon proper instrumentalities, such as shown more particularly in my aforesaid application, controls the re-starting of the blowing machine for the blowing and molding operations.

With this construction it will be seen that when the gather in its elongation has permitted the high tension current to pass through the circuit of the secondary of the transformer and to temporarily energize the magnet 14 contained therein, a current is permitted to temporarily pass through the circuit 9 and the magnet 8 is caused to lift the ball valve from its seat, whereby air under pressure will be admitted through the outlet port 7^c to the tubular piston 10 and acting upon the closed forward end of the cylinder 11 to shove the sliding head 3 forwardly. This movement of the head will bring one of the pins 12 into contact with the arm 13 of the air valve and open the latter to admit air to start the operation of the machine. As the air pressure controlled by the valve 7 may be quite heavy a temporary closure of the circuit 9 will under ordinary conditions be sufficient to admit sufficient air to cause the sliding head to complete its movement and this temporary closure effected by the electro-magnet 14 as before described. To insure however that the circuit 9 shall be broken upon the completion of the movement of the sliding frame the contact breaker 9^b is provided, the movable member 9^c of which is moved to open the circuit of the air valve before the frame completes its forward movement, which forward movement removes the electrodes from proximity to the descending gather and further permits the escape of the air, which has been admitted to the cylinder 11 through the valve 7, through the port 11^b in the cylinder. The blowing having been performed and the molds opened the sliding frame is returned to normal position by means of a tappet 15 mounted upon a rock shaft 16 and actuated by the connecting levers 17 in the manner described in my said application of even date herewith. Inasmuch as this application relates merely to the initial controlling device acted upon by the gather for effecting the control of the blowing machine, it has not been thought necessary in this application to discuss at length the accessory features set forth in my other said application.

I do not in this application claim a controller, actuated by the heat or elongation of

the gather for putting into operation glass blowing or molding mechanisms, as such matter is claimed in my other application serially numbered 601234, filed Jan. 6, 1911, as a division of my prior application serially numbered 524994, filed October 27, 1909, nor do I in this application claim movable means controlled by the elongation of a gatherer for closing the mold and retracting such means, as such matter is claimed in my aforesaid application #678231, to which the claims in this are subsidiary.

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

1. In a gather actuated controlling device for glass blowing machines, the combination with two electrodes having a gap between them, and located adjacent to the path of the descending gather, means for creating a difference of potential in the electrodes and means controlled by a current passing through the electrodes for controlling the movement of the blowing machine.
2. In a gather actuated controlling device, for glass blowing machines, the combination with a high tension circuit having a gap in proximity to the path of the descending gather, and means contained in the said circuit for controlling the movement of the blowing machine.
3. In a gather actuated controlling device for glass blowing machines, the combination with a high tension circuit having a gap in proximity to the path of the descending gather, a second circuit controlling the blowing machine and controlled by the first named circuit.
4. In a gather actuated controlling device for glass blowing machines, the combination with a source of high tension current, connections therefrom whereby the gather in its elongation becomes a part of the circuit from said source, an electro-responsive means contained in the said connections between the source and gather and energizing a controlling element of the blowing machine.
5. In a gather actuated controlling device for glass blowing machines, the combination with a source of energy, a partial circuit adapted to be completed by the gather and an electro-responsive device contained in said partial circuit for controlling the movement of the blowing machine.

ORIN A. HANFORD.

Signed in presence of—

SARAH W. NEWMAN,
J. DONALD SHORCERFT.