

No. 863,200.

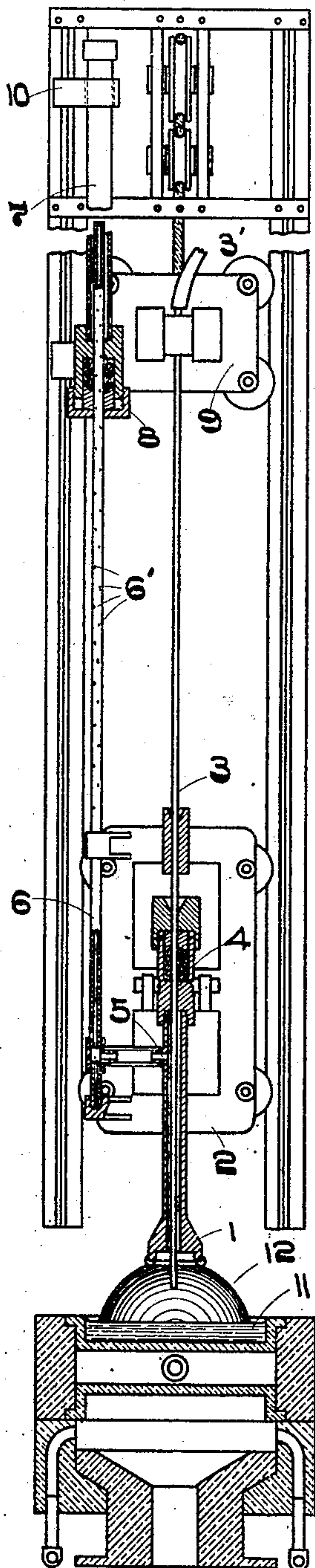
PATENTED AUG. 13, 1907.

I. A. MILLIRON.

AIR REGULATING DEVICE FOR GLASS DRAWING MACHINES.

APPLICATION FILED JUNE 5, 1906.

2 SHEETS—SHEET 1.



Witnesses

FIG. 1.

*Gilson Shaffer*  
*L. S. Inman*

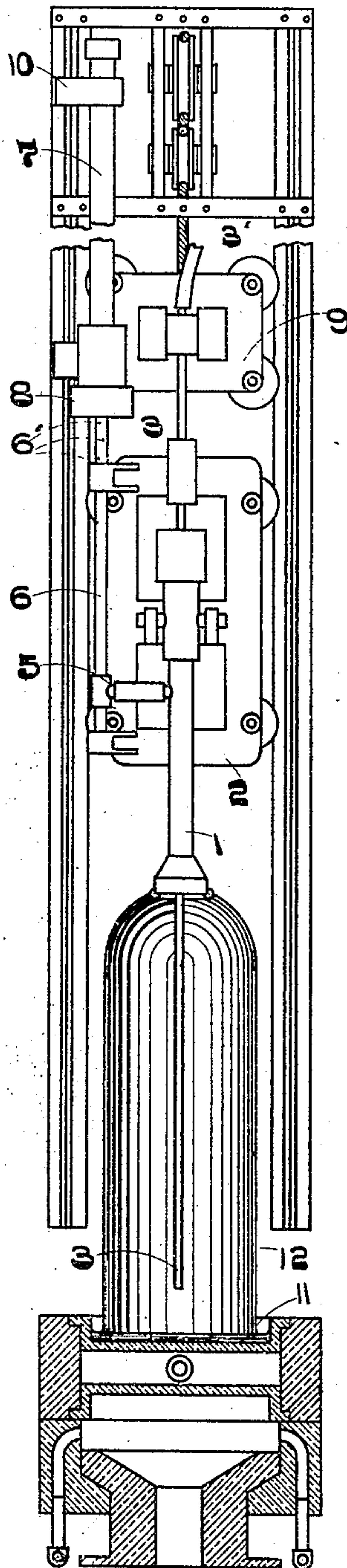


FIG. 2.

Inventor

By

Attorney

*I. A. Milliron*  
*Edward R. Inman*

No. 863,200.

PATENTED AUG. 13, 1907.

I. A. MILLIRON.

AIR REGULATING DEVICE FOR GLASS DRAWING MACHINES.

APPLICATION FILED JUNE 5, 1906.

2 SHEETS—SHEET 2.

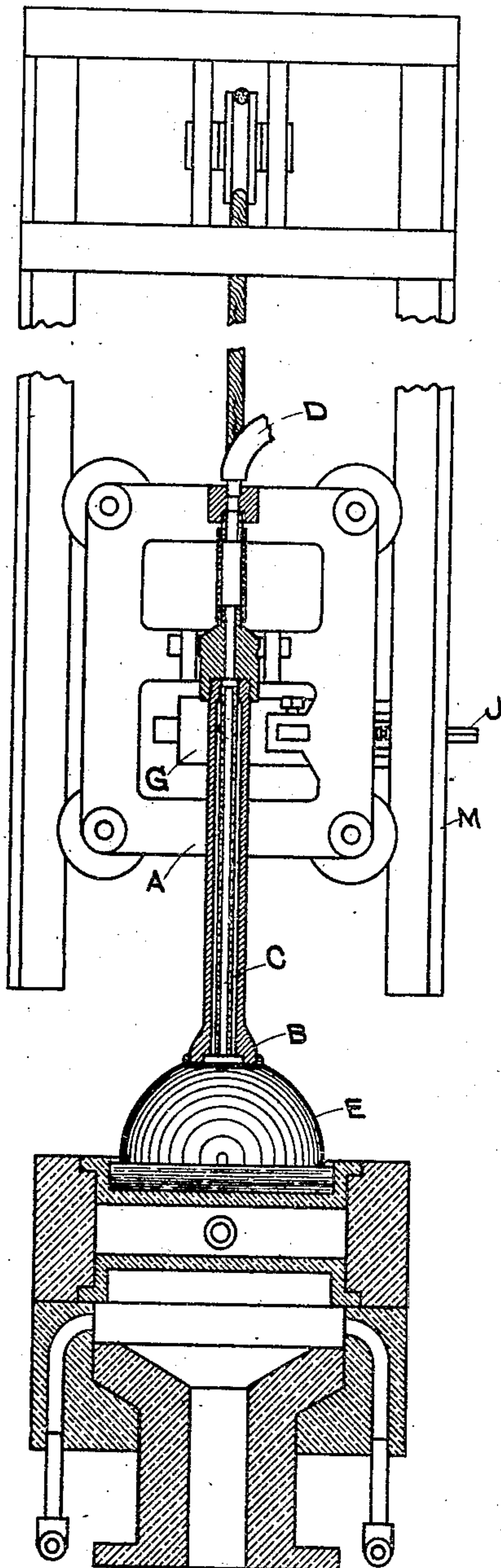


FIG. 3.

Witnesses

*Gilson Shaffer*  
*L. S. Inman.*

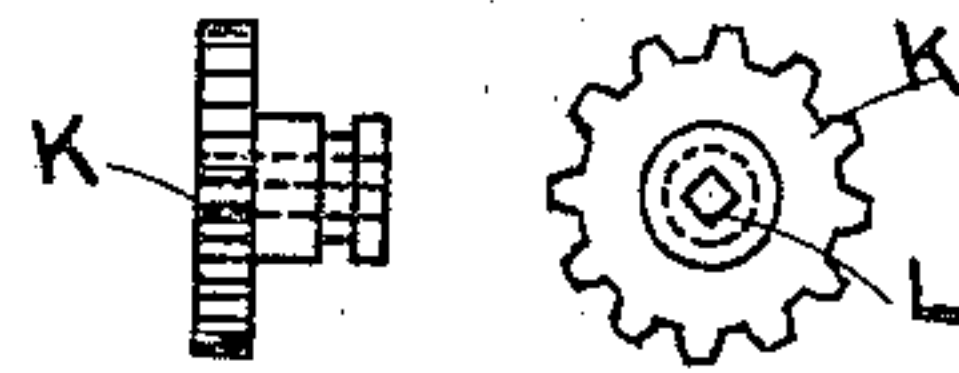


FIG. 4. FIG. 5.

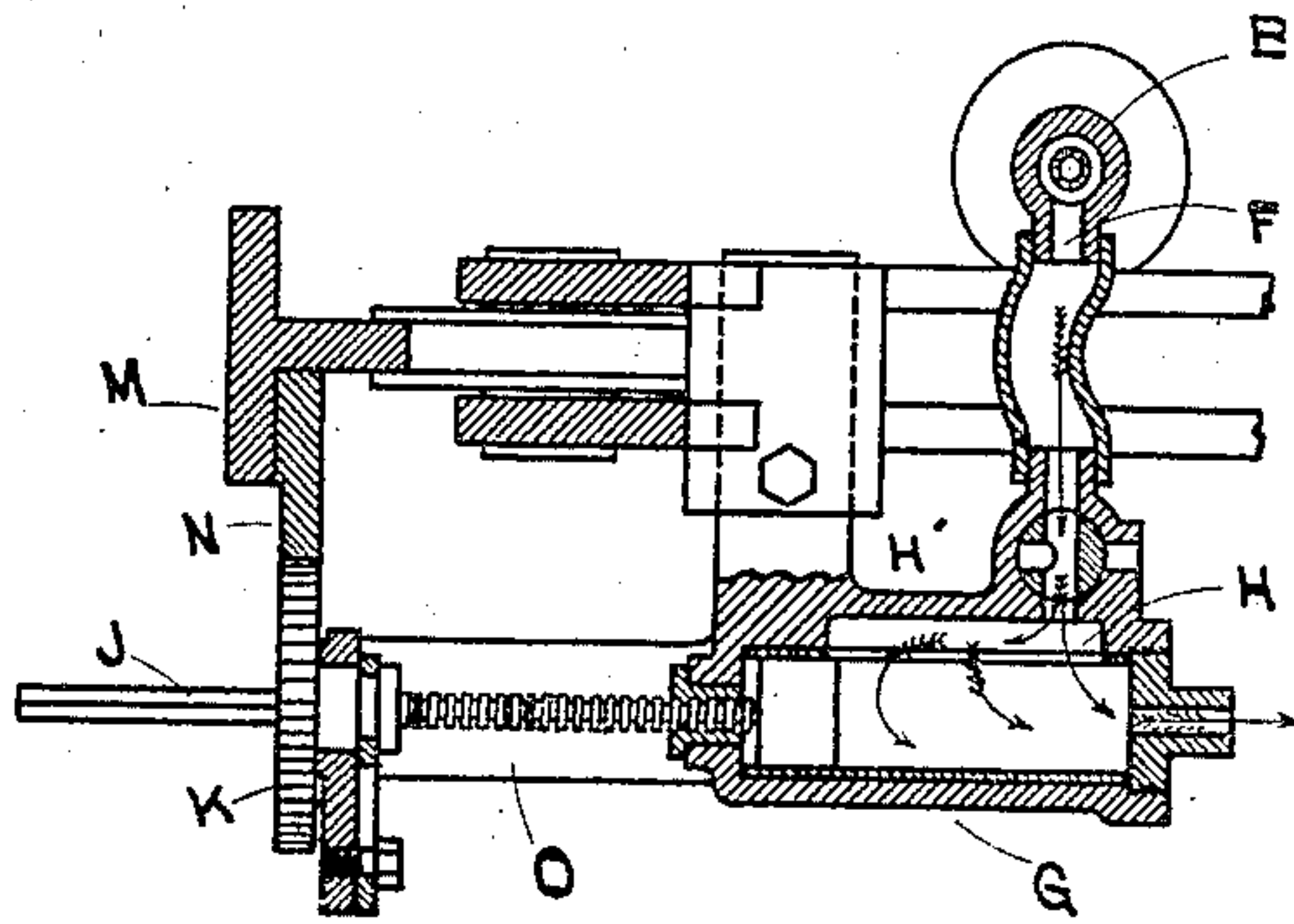


FIG. 6.

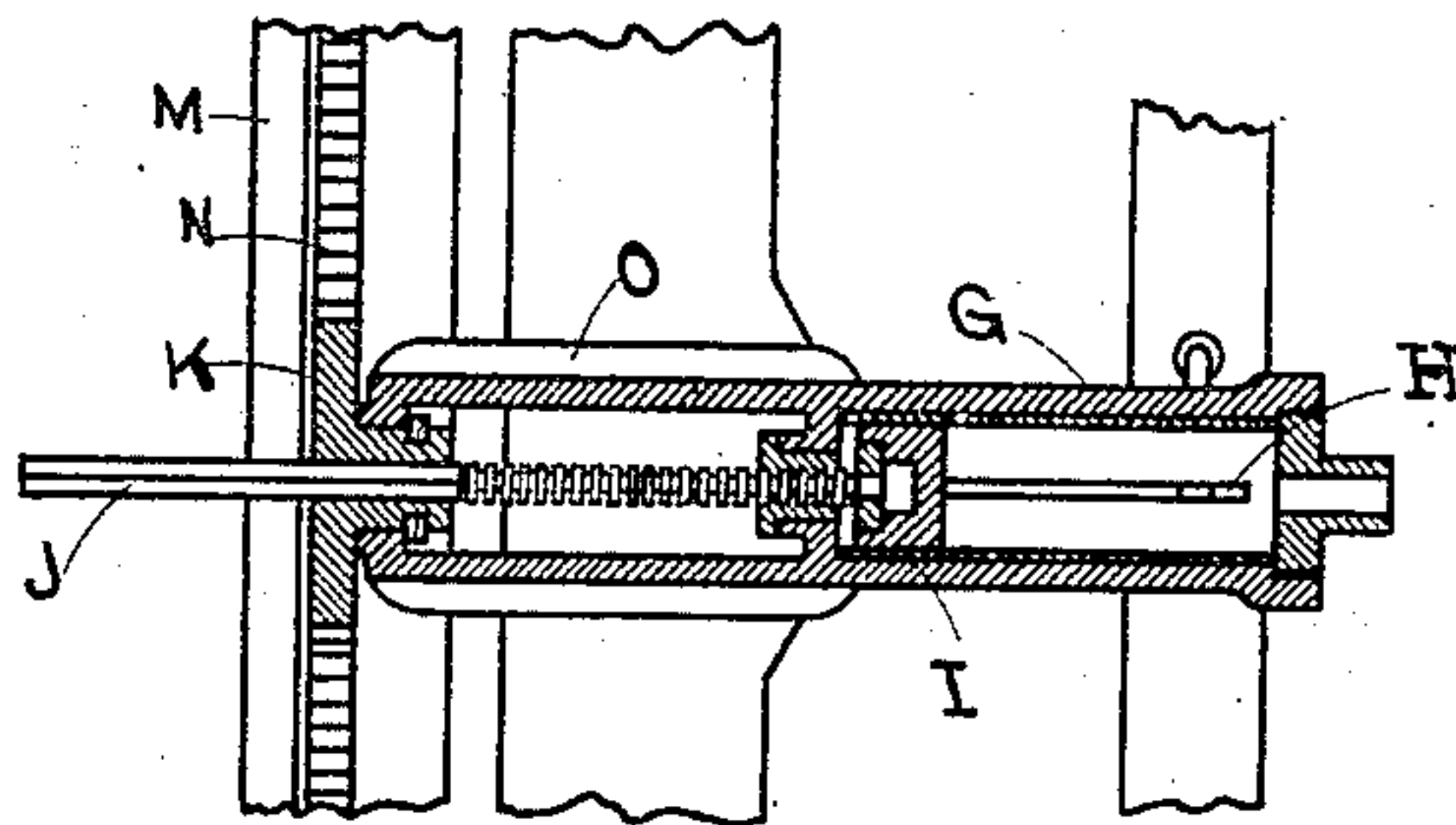


FIG. 7.

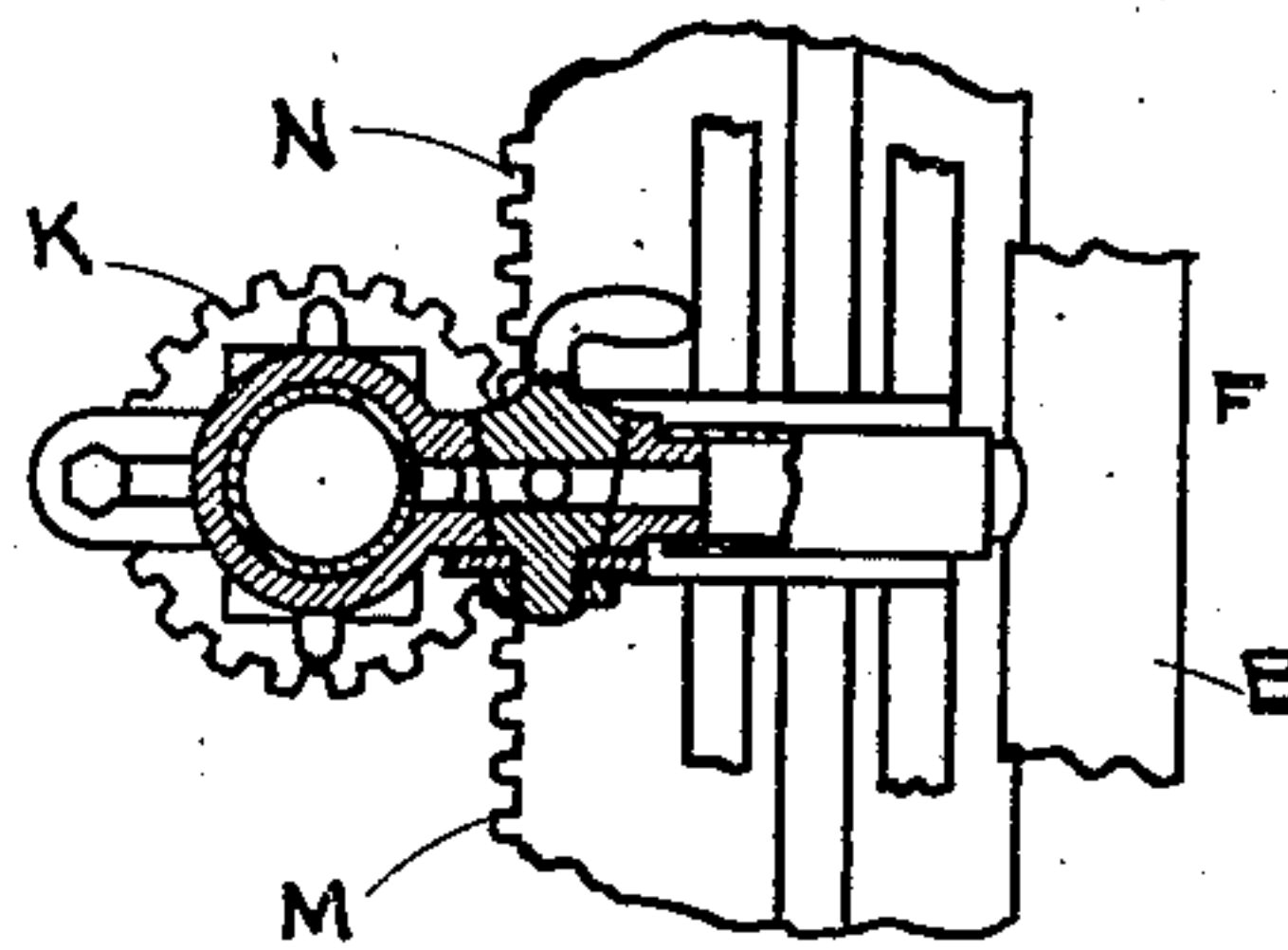


FIG. 8.

Inventor

By

Attorney

*Ira A. Milliron*  
*Edward R. Inman*



# UNITED STATES PATENT OFFICE.

IRA A. MILLIRON, OF FRANKLIN, PENNSYLVANIA.

## AIR-REGULATING DEVICE FOR GLASS-DRAWING MACHINES.

No. 863,200.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed June 5, 1906. Serial No. 320,303.

*To all whom it may concern:*

Be it known that I, IRA A. MILLIRON, a citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Air-Regulating Devices for Glass-Drawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to methods and apparatus for drawing hollow articles of glassware, such as cylinders, from a bath or body of molten metal, and consists in the improvements hereinafter described, and defined in the appended claims.

In the accompanying drawings I have illustrated glass-drawing apparatus embodying my improvements, in two somewhat different forms.

Other apparatus suitable for the practice of my invention may be devised by those skilled in the art, and I intend herein to illustrate and particularly describe only the forms which I regard as preferable.

Figure 1 is a view in elevation of such apparatus, portions of the same being shown in section, and the upper portion broken away. This view shows the position and relation of the parts at or about the beginning of the drawing operation. Fig. 2 is a similar view showing the apparatus at or about the completion of the drawing operation. Fig. 3 is an elevation of a modified form of apparatus. Figs. 4, 5, 6, 7 and 8 are details.

Referring first to Figs. 1 and 2:

A tubular bait 1 is mounted in a vertically movable carriage 2, through which extends a blow pipe 3, said bait being provided at its upper end with a stuffing box 4, to prevent leakage of air around said pipe 3. The bore of bait 1 is somewhat larger than the outside diameter of pipe 3.

In bait 1, at any point intermediate the stuffing box and the lower open end, is formed an air passage 5, which leads into the vertical perforated vent-pipe 6 which is attached to carriage 2, and is movable therewith. The upper end of said vent-pipe enters a larger pipe 7, which is closed at the top, and is of sufficient length to receive substantially all of pipe 6. Pipe 7 is provided at its lower end with a stuffing-box 8, through which pipe 6 passes, and leakage of air is thus prevented at this point. The perforations arranged lengthwise of the pipe 6 constitute in effect a unitary elongated vent-port, which is gradually closed, or reduced in area, as hereinafter described.

Pipe 7 is attached to a vertically movable carriage 9 and passes loosely through a guide 10, this construction being for the purpose of providing for a certain amount of vertical movement or adjustment of said pipe, the object of which adjustment will be hereinafter more fully set forth.

To pipe 3 is attached a flexible conduit or air-pipe 3',

which may lead to any suitable source of air or other fluid under pressure, not shown.

The operation of the apparatus is substantially as follows:—Preparatory to beginning the drawing operation, carriage 2 is lowered for the purpose of dipping the lower end of the bait 1 into the molten glass 11; this also withdraws vent-pipe 6 from pipe 7, leaving the greater portion of said pipe 6 exposed, so that air may escape through the perforations 6' therein. When bait 1 becomes properly heated, so that molten glass adheres thereto, air or other fluid adapted to exert pressure upon the interior of the article is admitted to pipe 3 and a bubble 12 is blown which, as carriage 2 and bait 1 are raised, lengthens into a cylinder of glass. A portion of the air which has entered the cylinder by way of pipe 3, passes up through the bait into the vent-pipe and escapes through the perforations, but as carriage 2 rises, and the cylinder of glass lengthens, pipe 6 is telescoped, or passes into pipe 7, thus leaving fewer perforations 6' open to the atmosphere, consequently less air escapes from pipe 6, and a larger portion of it remains in the cylinder. The amount or length of exposed, perforated pipe may be varied, by raising or lowering carriage 9, and the rate of speed at which the vent-pipe 6 enters pipe 7 may be regulated by raising both carriages together, but causing carriage 9 to rise more slowly than carriage 2—that is, by giving to said carriages a differential motion.

The apparatus shown in Fig. 3 and the details related thereto are substantially as follows:—To a vertically-movable carriage A is attached a tubular bait B, through which extends a blow-pipe C. Air is supplied to pipe C through a flexible conduit D. The air passes into the cylinder E which is being drawn and may escape therefrom through the bait B, an escape-port F being formed in said bait, through which air escapes by way of the regulating-valve, which is mounted upon carriage A and constructed as follows:—The cylinder G has a very narrow slot H extending longitudinally of one side thereof, which slot communicates with an air-chamber H', Fig. 6, which is directly connected with the interior of bait B. The piston I in the cylinder G is attached to a screw-threaded stem J', which passes through a screw-threaded cap at the end of cylinder G, the outer end of which stem is square, and passes loosely through the square hole in pinion K. Upon the vertical guide M is formed a rack N, with which pinion K meshes. Pinion K is revolutely mounted in a bracket 6 provided therefor, upon the end of the valve-cylinder G. When carriage A is at its lowest position, as shown in Fig. 3, piston I is drawn clear out, so that it stands in the position shown in Fig. 7, and air has a free passage or escape through the valve, as shown by the arrows in Fig. 6. As the carriage moves up and the cylinder of glass E lengthens, piston I moves toward the other end of the cylinder G, thus re-



ducing the amount of air which passes through the valve.

In the operation of the apparatus above described the volume and pressure of the air passing through the blow-pipe into the cylinder are maintained constant, and a means of escape for a portion of the air within the cylinder is provided, which is open at all times, but is gradually reduced in size, as the drawing operation progresses. In this respect my apparatus is substantially different from devices supplied with "safety-valves," which are adjusted to yield and open only to a pressure exceeding a predetermined amount, and to close again as soon as the pressure has been sufficiently reduced.

My invention is not limited to the employment of air alone, but other fluid adapted to exert the desired pressure upon the interior of the cylinder may be used, if desired.

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

1. In air-regulating apparatus for glass-drawing machines, a tubular bait, a blow-pipe extending into the same, means for admitting air through said pipe, means for permitting the continual escape of air from said bait, and means for automatically varying the area of said air-escape during the drawing operation.

2. In air-regulating apparatus for glass-drawing machines, means for admitting air to the interior of the article being drawn, means for permitting the escape of air from said article, and means for automatically decreasing

the area of said air-escape as the drawing operation progresses.

3. In apparatus for drawing glass articles, a tubular bait, means for moving said bait, a blow-pipe extending through said bait and adapted to deliver air to the article being drawn, a vent-port for the escape of air from said bait, and means for automatically decreasing the area of said vent-port as the operation progresses.

4. In air-regulating apparatus for glass-drawing machines, a vertically-movable carriage, a tubular bait attached thereto, a blow-pipe extending through said bait, and constructed to deliver air to the interior of the article being drawn, an air-escape in said bait, a perforated pipe with the interior of which said escape communicates, said perforations being open to the atmosphere at the beginning of the drawing operation, and automatic means for gradually preventing the escape of air from said perforations as the drawing operation progresses.

5. In the manufacture of hollow glass articles, drawing the article from a body of molten glass, supplying air to the interior of the article being drawn, permitting a portion of such air to escape from the article throughout the drawing operation, and gradually decreasing the quantity of escaping air as the drawing operation progresses.

6. In a glass-drawing apparatus, a bait or glass-drawing tool, having a passage leading from an air-supply to the interior of the cylinder, and a constantly open passage or duct leading from the interior of the cylinder to the atmosphere.

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

IRA A. MILLIRON.

Witnesses:

E. R. INMAN,  
L. S. INMAN.