No. 804,533. PATENTED NOV. 14, 1905.

# G. H. HARVEY.

## GLASS DRAWING MACHINE.

APPLICATION FILED MAR. 3, 1904.

Fig. I.

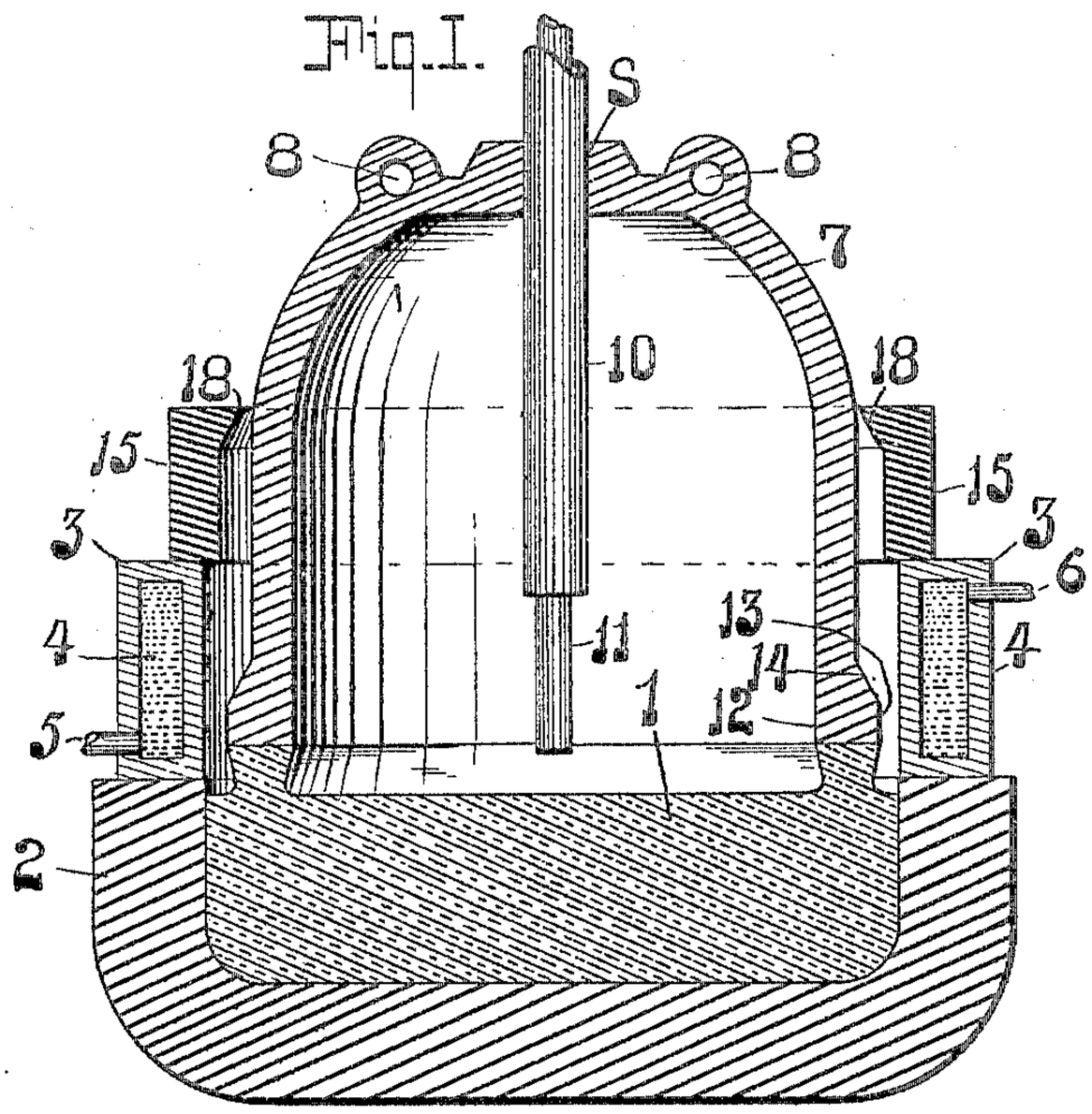



Fig. III.

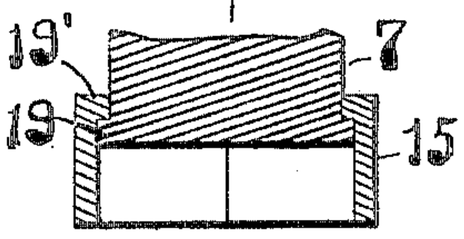



Fig. II.

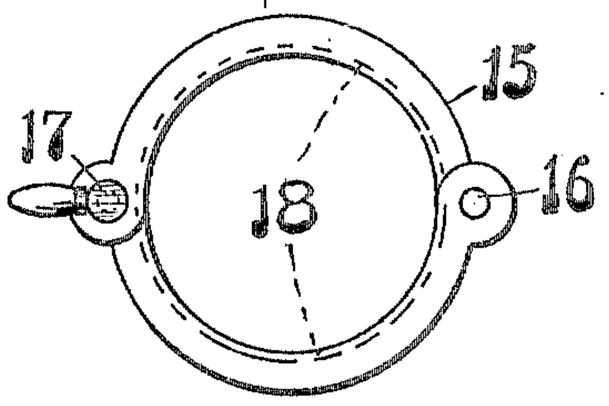



Fig. IV.

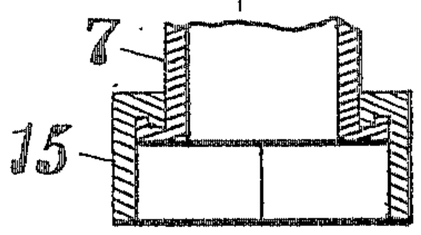



Fig. V.

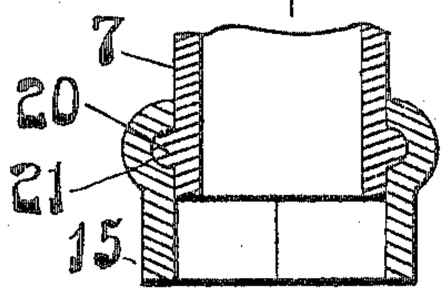



Fig. VII.

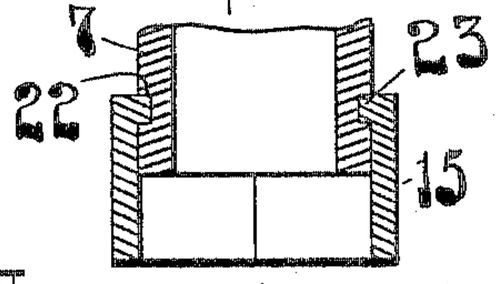



Fig. VI.

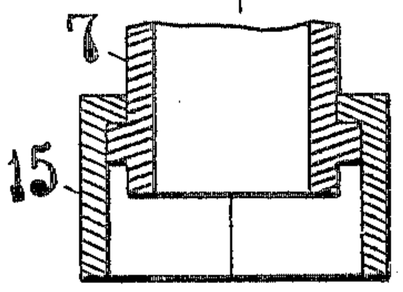



Fig. VIII.

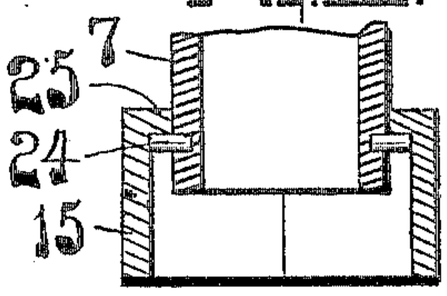
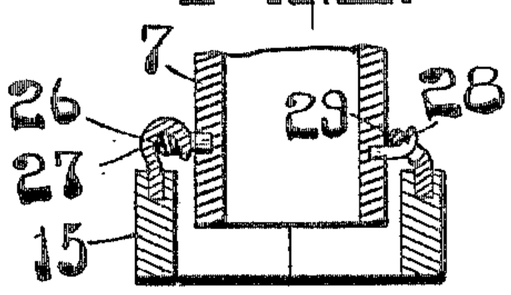



Fig. IX.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE H. HARVEY, OF GLENFIELD, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM L. PIERCE, OF ENGLEWOOD, NEW JERSEY.

## GLASS-DRAWING MACHINE.

No. 804,533. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed March 3, 1904. Serial No. 196,255.

*To all whom it may concern:*

Be it known that I, GEORGE H. HARVEY, a citizen of the United States, residing at Glenfield borough, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Glass-Drawing Machines, of which the following is a specification.

In the accompanying drawings, Figure I is a vertical section of a portion of a glass-drawing machine. Fig. II is a plan view of a heating-iron. Figs. III, IV, V, VI, VII, VIII, and IX are vertical sections, partly broken away, showing the lower ends of gatherers and heating-irons secured thereto.

The object of my invention, generally stated, is to provide, preferably, portable means for reheating the lower extremity of the gatherer and its pendent glass preferably just after the draw from the receptacle is commenced, as will be apparent from the more detailed description which follows, reference being had to the drawings, which are, however, merely illustrative of the general principles of my invention.

Glass 1 in a liquid or semiliquid condition is contained in a receptacle 2, which receptacle may be of any desired design.

3 represents a cooler having an annular chamber 4, inlet-pipe 5, and an outlet-pipe 6 for the admission and discharge of a cooling medium.

7 is a gatherer having eyelets 8 8 or other suitable means for attaching the hoisting mechanism (not shown) used for raising and lowering the same.

9 is an orifice through which a pendent tube 10 passes. 11 also represents a pendent tube within tube 10, but of a diameter sufficiently less so that a passage exists around the same.

The lower extremity 12 of the gatherer 7 is reinforced circumferentially at 13 and has an inclined taper 14 from the body of the gatherer.

15 represents a portable means used for reheating the end of the gatherer and is preferably composed of two sections hinged together at 16, capable of being locked together at 17, and having internal peripheral inclined edges 18. The reheater shown does not itself develop heat, but receives or absorbs it from some heat-generator and gives it off by radiation—that is, the heat is not radiated directly from a flame.

The general operation is as follows: Assuming in Fig. 1 that the glass 1 contained in the receptacle 2 is in a condition suitable for drawing in cylindrical, flat, or other form, that a cooling medium is circulating through the chamber 4 of the cooler 3, and the reheater 15 removed, the operator lowers the gatherer by suitable means secured in the eyelets 8 8 within the orifice formed by the annular cooler 3 until the rim of the gatherer 7 is immersed in the glass 1, contained in the receptacle 2. After the glass adheres thereto the gatherer is raised at the speed best suited to cause the adhering glass to be raised therewith and of a uniform thickness. A gaseous fluid under pressure passes down through pipe 11 and fills the space within the draw, while the surplus passes off through the outer tube 10. Preferably the reheater 15 is closed and locked around the shell of the gatherer 7 before its inclined taper 14 reaches the top of the cooler 4. The purpose of the reheater is to reinforce or maintain the heat of the lower extremity of the gatherer and that portion of the glass pendent thereto for the following reasons: In the ordinary form of gatherer as in use at present the outlet for the surplus gaseous pressure is through a port in the top of the gatherer, which tends to chill the gatherer, causing a contraction thereof and frequently causing the adhering glass to crack and break off from the gatherer and fall back into the receptacle, thus destroying the draw. The importance, therefore, of maintaining or increasing the heat of the lower extremity of the gatherer and that portion of the glass pendent thereto is evident. Hence I attach a suitable device to the gatherer, preferably as shown, to maintain or reinforce the heat, thus preventing an uneven contraction of the gatherer and pendent glass at their junction, and thereby assuring a means for preventing the adhering glass from becoming dislodged from the gatherer during the time of drawing from the receptacle. As the gatherer 7 continues to rise its incline 14 comes in contact with the incline 18 of the reheater 15 and carries it along, thus renewing the initial heat of the lower extremity of the

gatherer. It is understood that the reheater 15 is first heated to suit the requirements. After the gatherer 7 and the pendent glass have been drawn upwardly the predetermined distance the pendent glass is ready to be disconnected from the glass contained in the receptacle.

For the purpose of illustration I have shown a hollow gatherer as drawing a cylinder of glass in connection with my invention; but a solid gatherer in any desired shape could be used for drawing flat or other shapes, and my device could be attached thereto with advantage for the purpose described. Hence I do not limit the use to the one form of gatherer, but include gatherers of whatsoever design when a portable reheating agent is carried therewith.

In Fig. III, I have shown in vertical section the gatherer 7 as solid and its lower end having a flange 19 integral therewith. The reheater 15 has a corresponding flange 19′, which engages it. In Fig. IV and Fig. VI the gatherers 7 likewise have flanges of different shapes and the reheaters 15 corresponding flanges which engage therewith. In Fig. V the gatherer 7 has a web 20, while the reheater 15 has a groove 21, which engages the web 20. In Fig. VII the gatherer has a groove 22, while the reheater 15 has a flange 23, which engages with the groove 22.

In Fig. VIII a series of pins 24 are inserted in the gatherer 7, and the reheater 15 engages them by means of a flange 25, and in Fig. IX, secured at one side of the gatherer 7, I show an eyelet 26, engaging a hook 27, secured to the reheater 15, while secured to the other side of the gatherer I show a hook 28, engaging an eyelet 28, secured to the reheater 15.

What I claim is—

1. In the manufacture of glass, a gatherer adapted to draw glass from a receptacle and portable heat absorbing and radiating means for heating the end of the gatherer as it leaves the receptacle with the glass pendent therefrom.

2. In the manufacture of glass, a gatherer adapted to draw glass from a receptacle, portable heat absorbing and radiating means for heating the end of the gatherer as it leaves the receptacle with the glass pendent therefrom and means for securing said portable means to said gatherer so that the said portable means travels with the gatherer while the gatherer is drawing the glass from said receptacle.

3. In the manufacture of glass, a gatherer adapted to draw glass from a receptacle, means for heating the gatherer, and means for causing the heating means to travel with the gatherer after the latter has made a portion of its travel.

4. In the manufacture of glass, a gatherer adapted to draw glass from a receptacle, a heater normally held above the lower end of the gatherer, and means for causing the heater to travel with the gatherer when the former is positioned to heat the lower end of the latter.

Signed at Pittsburg, Pennsylvania, this 1st day of March, 1904.

GEORGE H. HARVEY.

Witnesses:

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EDWARD A. LAURENCE.