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METHOD AND MACHINE FOR FEEDING MOLTEN GLASS.

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1,234,934. Patented July 31, 1917.

Fig. 4.

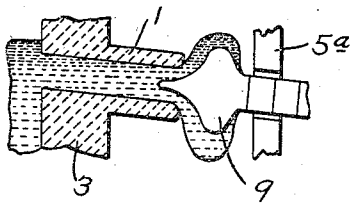

Fig. 2.

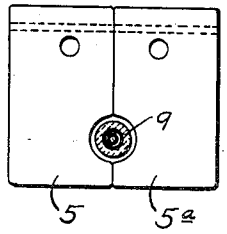

Fig. 1.

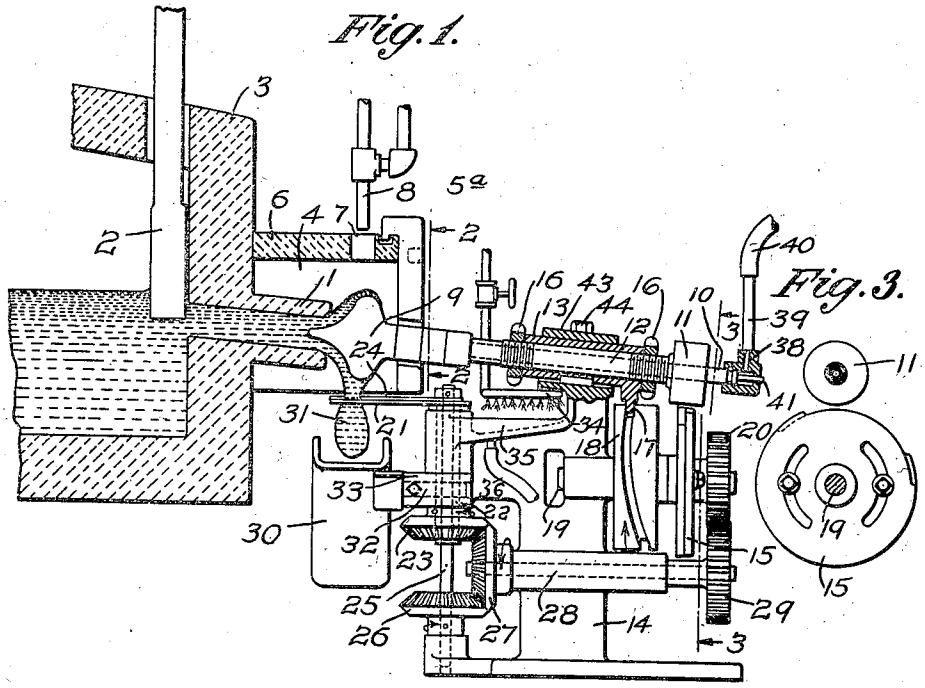

Fig. 3.

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UNITED STATES PATENT OFFICE.

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METHOD AND MACHINE FOR FEEDING MOLTEN GLASS.

1,234,934. Specification of Letters Patent. Patented July 31, 1917.

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To all whom it may concern:

Be it known that I, KARL E. PEILER, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Methods and Machines for Feeding Molten Glass, of which the following is a specification.

This invention relates to the art of gathering separate masses of molten glass in suitable condition for subsequent shaping operations.

The object of the present invention is to provide a method and apparatus for feeding masses or gathers of molten glass, uniform in size, consistency and temperature, and in timed relation, to molds or other shaping devices.

In the embodiment of the invention illustrated herein this object is attained by flowing the viscous glass from the furnace outlet against a gathering head which is rotated to distribute the accumulating glass around the head. When the accumulation is sufficient for the purpose the head is slowed or stopped to permit the glass to shed downwardly by gravity and form a depending ball which is then severed and conducted away. These operations take place in a heated chamber in order to keep the glass in proper working condition and the gathering and severing implements are cooled so that they will best perform their functions.

The gathering head is mounted for axial movement toward and from the furnace outlet, to regulate the flow of glass to the head, and when desired, to arrest the flow more or less completely while a gather is being shed or discharged from the head.

In the views Figure 1 shows a side elevation of the active mechanisms and a section of the wall of the furnace and heating chamber. Fig. 2 is a section on the plane indicated by the dotted line 2—2 on Fig. 1 showing the front wall of the heating chamber. Fig. 3 is a section on the plane indicated by the dotted line 3—3 on Fig. 1 showing the adjustable means for periodically rotating the gathering head. Fig. 4 illustrates the distribution of the gather around the head.

The furnace 3 indicated in the views has a discharge outlet or spout 1, and an adjustable gate 2 for regulating the flow of glass to the outlet. The spout projects into a chamber 4 having walls of refractory material. In the form shown the front wall is made of two sections 5 that are hung upon the upper edge of the top wall 6 so that they may be drawn apart and separated to permit access to the chamber and the withdrawal of the gathering head. Suitable gas burners 8 are arranged to blow gas flames through apertures 7 into the chamber.

The gathering head 9 of refractory material is attached to the end of a tubular shaft 10 that is provided with a pulley or friction roll 11. This shaft is mounted so that it will rotate in a sleeve 12 which is slidably held in a bearing 13 at the top of the frame 14. The gathering head shown is shaped like a turnip or an acorn, and is located in the hot chamber 4, with its apex and the axial line of the supporting shaft pointing toward and into the discharge spout 1. This head and its shaft are preferably tubular in order that air may be circulated through them to prevent the head from becoming overheated. For rotating the head at the proper time a pulley 11 on the shaft 10 is arranged to be engaged by the sectional driving disks 15. A portion of the periphery of each section of the driving disk is cut away or relieved, and these sections are adjustably secured together so that the relieved portion of the disk may be lengthened and shortened according to the time it is desired to arrest the rotations of the head. When the periphery of the disk engages the pulley the head is rotated, and when the relieved portion of the disk reaches the head it remains stationary.

The head 9 is adjusted longitudinally toward and from the spout by means of the nuts 16 which turn on threaded portions of the sleeve 12, and the bearing 13 has an extension 17 that projects into a cam groove in the cam 18. This cam groove is cut to give the desired longitudinal movement to the shaft and gathering head and it is mounted on the shaft 19 on which the sectional head rotating disk is mounted and which is provided with a driving gear 20.

As the molten glass flows through the discharge outlet from the furnace onto the head it is flared outwardly and distributed around the head, upon which a mass is thus accumulated. As this takes place the head is preferably retracted by the cam 18 from the outlet to facilitate and regulate the flow of glass. After a sufficient quantity has been gathered the rotation of the head

ceases and it is also preferably moved endwise, closer to the outlet, to diminish or check further flow from the discharge outlet. With the head nearly or quite stationary the glass sags or is shed from the head and forms a depending ball, which is then cut off by shear blades 21 and 24. The lower blade 21 is fastened to a sleeve 22 which is provided with a bevel gear 23, and the upper blade 24 is fastened to a shaft 25 that extends through the sleeve 22, and is provided with a bevel gear 26. Engaging these gears so the shears revolve oppositely is a bevel gear 27 on a shaft 28 provided with a gear 29 in mesh with the gear 20. This mechanism is timed so that the rotating shear blades will come together and cut off the depending mass of glass at the proper time, allowing it to drop into molds, either directly or through the chute 30, which is mounted below the heating chamber on a stem or stud 32 that is adjustably held in a bracket 33 projecting from the frame. A sprayer 34 connected with a water supply is arranged to throw cooling water upon the shears when they are turned back away from under the furnace. A drip pan 35 provided with a pipe 36 is located beneath the sprayer for collecting and conducting away the water which falls from the sprayer.

The mechanism here shown may be driven in any convenient way from, or in connection with, the glass shaping machine with which it is associated, as for example by means of a train of gears connecting with the gear 29.

The supply of air for preventing the overheating of the gathering head may be applied in any well-known way. It is here shown as being applied by means of a swiveling air head or cap 38 mounted upon the end of the hollow shaft 10, so that the latter may revolve within the air cap without turning the latter. The air cap is provided with pipe connections 39 and 40, the latter of which is connected with a supply of air under pressure, and is sufficiently flexible to permit the longitudinal movements of the gathering head. The air entering from these pipes through the air cap 38 passes longitudinally through the hollow shaft 12 to the gathering head and returns through an interior pipe 41 in a manner well known in this art.

The outlet for the glass is here shown to be through a closed or tubular spout 1. This, however, although preferable, is not an essential feature, since the glass may under some conditions or for some purposes be discharged through an outlet open at the top.

As the reciprocating head is moved away from the outlet it tends to draw out and thus facilitate the flow of the glass, besides giving it more room to flow around the head between the latter and the outlet. The rotary movement of the glass as it is carried by the head tends also to wipe or scour the outlet, thus maintaining a free and clean flow, and thereby tending to prevent accumulations of chilled glass in and around the outlet, assisted in this respect by the drawing out action above referred to.

The viscous character of the glass makes it usually unnecessary to move the head close against the spout or outlet to stop or check the flow of the glass to a sufficient extent. The range or zone of longitudinal movement may be adjusted by means of the nuts 16 while the machine is in operation, thus establishing and maintaining under working conditions, the proper flow of the glass and the extent to which the flow is arrested when shedding the accumulated gather.

To facilitate the ready removal and replacing of the gathering head, a removable cap or half-box 43 is provided for the bearing 13, held in place by a bolt or bolts 44. By removing these bolts and the cap 43, and sliding back the front wall sections 5 and 5ª, the gathering head and its shaft are free to be removed from working position and another head substituted.

The size of the outlet and of the gathering head, the degree of their inclination, and other relevant features should be adapted to the character of the glass and the character and the size of the gathers to be formed. Similarly in various ways well understood in this art the various parts should be adapted and adjusted to the performance of their respective functions.

I claim as my invention:—

1. The combination, with the discharge outlet of a container for molten glass, of a rotary gathering head located substantially in axial alinement with the flow of glass through said outlet, and means for rotating said head.

2. The combination, with a container for molten glass having a discharge spout, of a rotary gathering head located in front of and substantially in axial alinement with said spout, and means for rotating said head.

3. The combination, with a container for molten glass having an outlet spout, of a rotary gathering head disposed in front of and projecting into said spout, and means for rotating said head.

4. The combination, with a rotary gathering head, of a container for molten glass having a flow outlet disposed adjacent to the head and substantially in the axial line of rotation thereof, and means for rotating the head.

5. The combination, with the discharge outlet of a glass furnace, of a rotary gathering head disposed adjacent to the outlet, and substantially in axial alinement therewith,

means for rotating the head, and means for moving the head in an axial direction.

6. The combination with the discharge outlet of a glass furnace, of a rotary gathering head located with the axial line of its rotation pointing toward the outlet, means for rotating the gathering head, and means for adjusting the longitudinal position of the head.

7. The combination, with the discharge outlet of a glass furnace, of a rotary gathering head disposed in front of said outlet, means for rotating the head, means for reciprocating the head longitudinally, and means for adjusting the position of the longitudinal movements.

8. The combination, with a glass furnace having a discharge outlet, of a rotary gathering head located in front of said outlet, and means for variably rotating said head.

9. The combination, with a glass furnace having a discharge outlet, of a rotary and reciprocatory gathering head located in front of said outlet, mechanism for variably rotating said head, and mechanism for moving said head toward and from said outlet.

10. The combination, with a glass furnace having a discharge outlet, of a heating chamber about said outlet, a rotary gathering head located in said chamber in front of said outlet, and mechanism for variably rotating said head.

11. The combination, with a glass furnace having a discharge outlet, of a heating chamber about said outlet, a rotary and reciprocatory gathering head located in the chamber in front of said outlet, mechanism for variably rotating said head, and mechanism for moving said head toward and from said outlet.

12. The combination, with a glass furnace having a discharge outlet, of a rotary gathering head located in front of said outlet, mechanism for rotating said head, and a heating chamber inclosing said orifice and the gathering head, the front wall of said chamber being in separable sections to permit the withdrawal of the head.

13. A glass gathering apparatus consisting of a rotary and reciprocatory gathering head, rotary shear blades located below the head, mechanism for intermittently rotating the head, means for determining the periods of rotation of the head, mechanism for reciprocating the head, and mechanism for rotating the shear blades.

14. The method of gathering charges of molten glass, which consists in flowing the glass, flaring the flowing glass outwardly and accumulating the flaring portion until the desired size of gather is obtained.

15. The method of gathering charges of molten glass, which consists in flowing the glass, spreading and winding the glass in an outwardly flaring spiral form, until the desired gather is obtained.

16. The method of gathering charges of molten glass, which consists in flowing the glass, spreading the flowing glass in an outwardly flaring form, and winding the flared portion to accumulate the desired gather.

17. The method of gathering charges of molten glass, which consists in flowing the glass, spreading the glass as it flows in an outwardly flaring form, winding the flared portion to accumulate the desired gather, and finally shedding the gather.

18. The method of gathering masses of molten glass, which consists in flowing the glass and assisting the flow by drawing action and at the same time winding the glass into a mass, then checking the flow of glass and stopping the winding and allowing that glass which is wound to gather into a depending ball.

19. The method of gathering masses of molten glass, which consists in flowing the glass, assisting the flow by drawing action and at the same time winding the glass into a mass, then checking the flow of glass and stopping the winding and allowing the glass which is wound to gather into a depending ball and finally cutting off said depending ball.

20. The method of gathering masses of molten glass, which consists in flowing the glass, assisting the flow by drawing action and at the same time winding the glass into a mass in a heated atmosphere, then checking the flow of glass and stopping the winding and allowing that glass which is wound to gather into a depending ball and finally cutting off said depending ball.

Signed at Hartford, Conn. this 1st day of December, 1916.

KARL E. PEILER.