A. L. SCHRAM.

GLASS GATHERING MACHINE.

APPLICATION FILED FEB. 28, 1910.

1,024,228.

Patented Apr. 23, 1912.

4 SHEETS—SHEET 1.

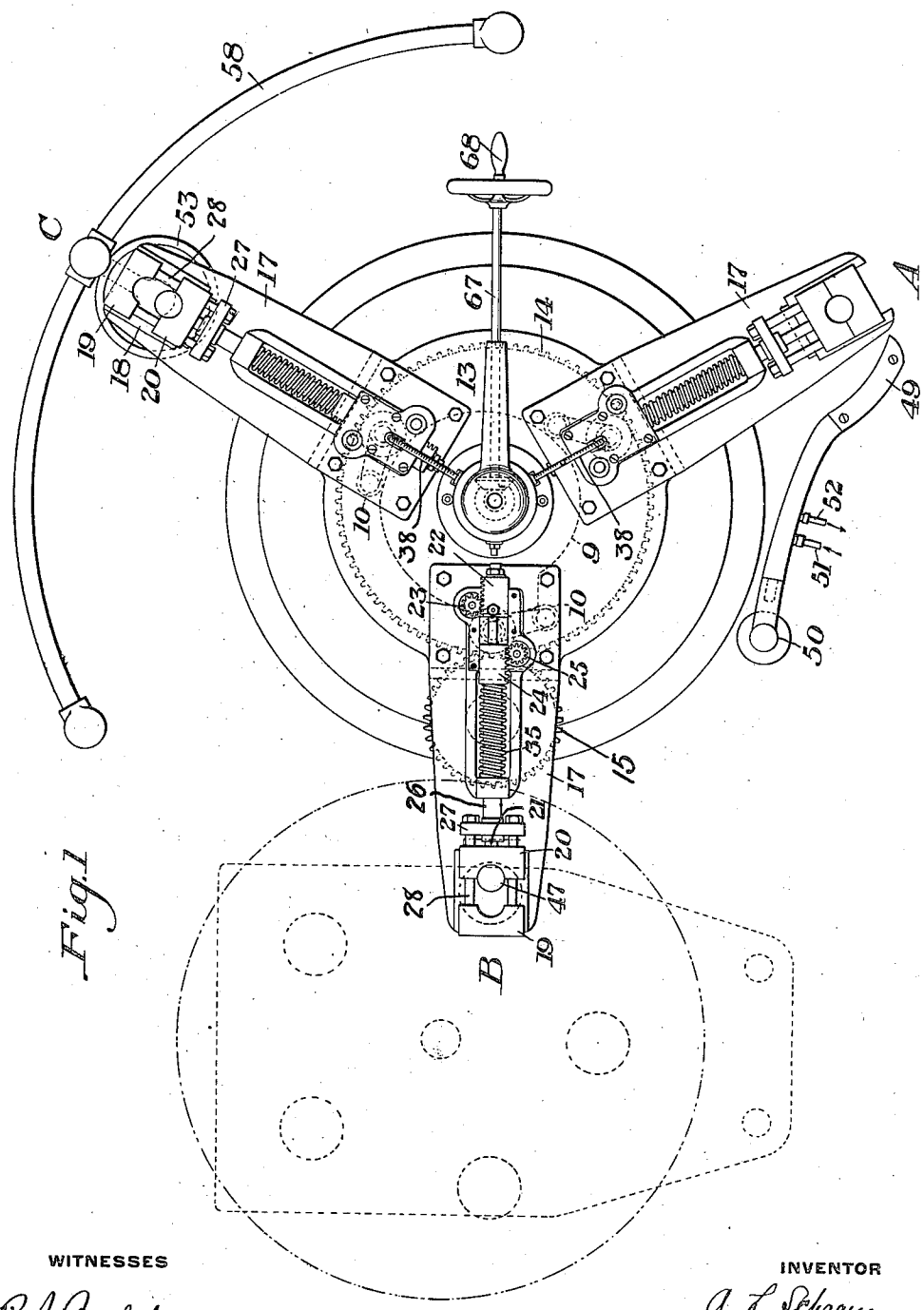

Fig. 1

WITNESSES

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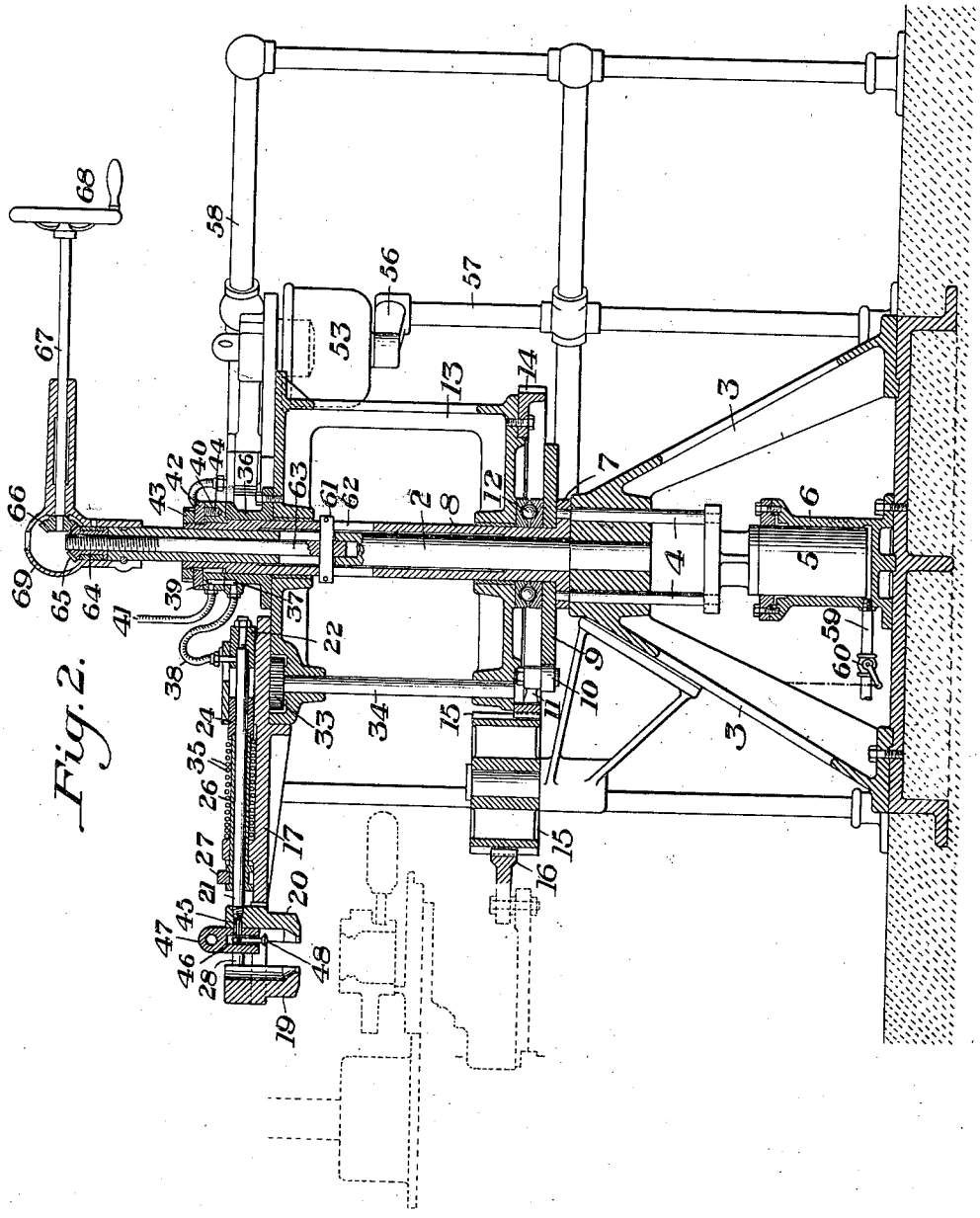

Fig. 2.

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4 SHEETS—SHEET 3.

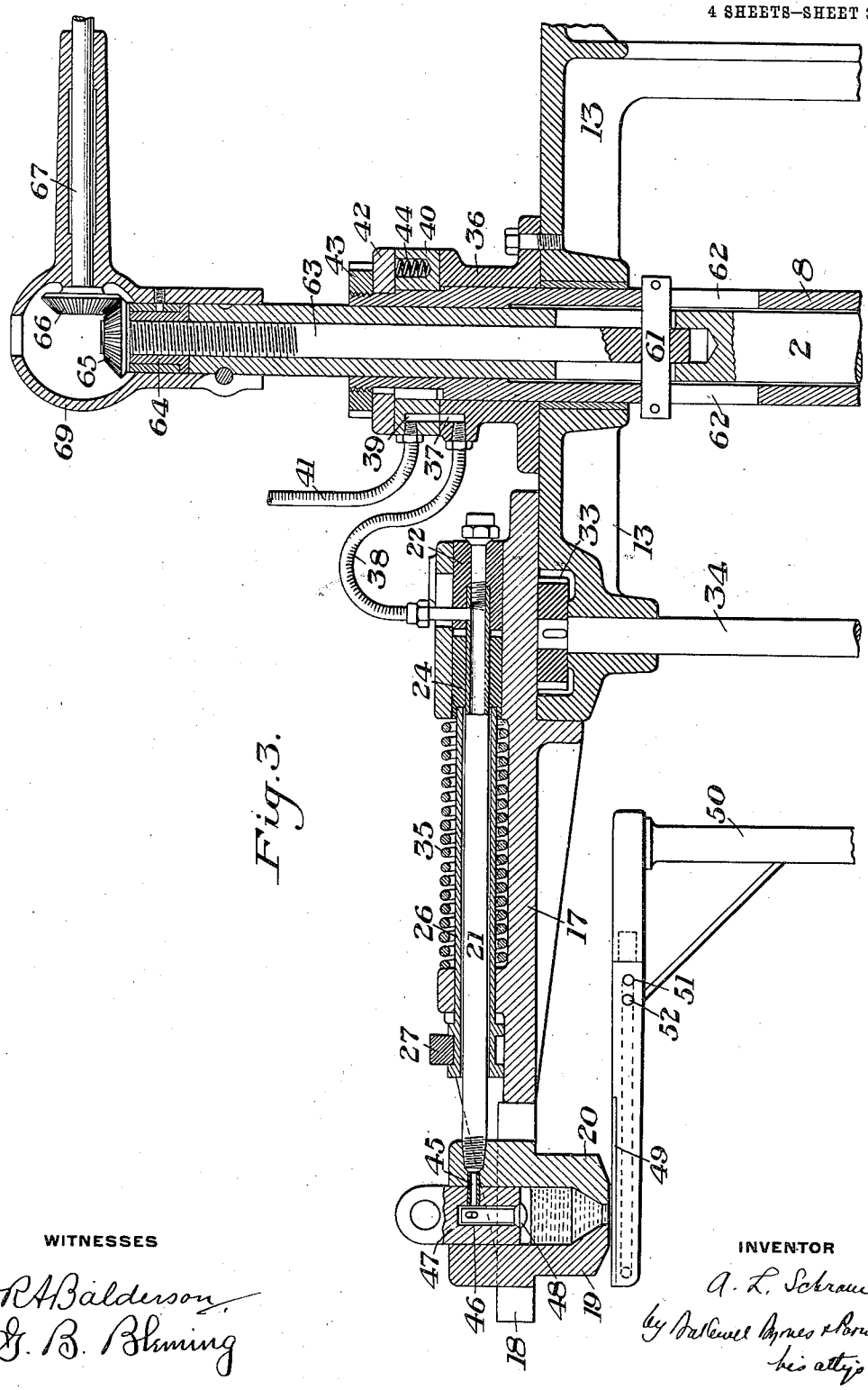

Fig. 3.

WITNESSES

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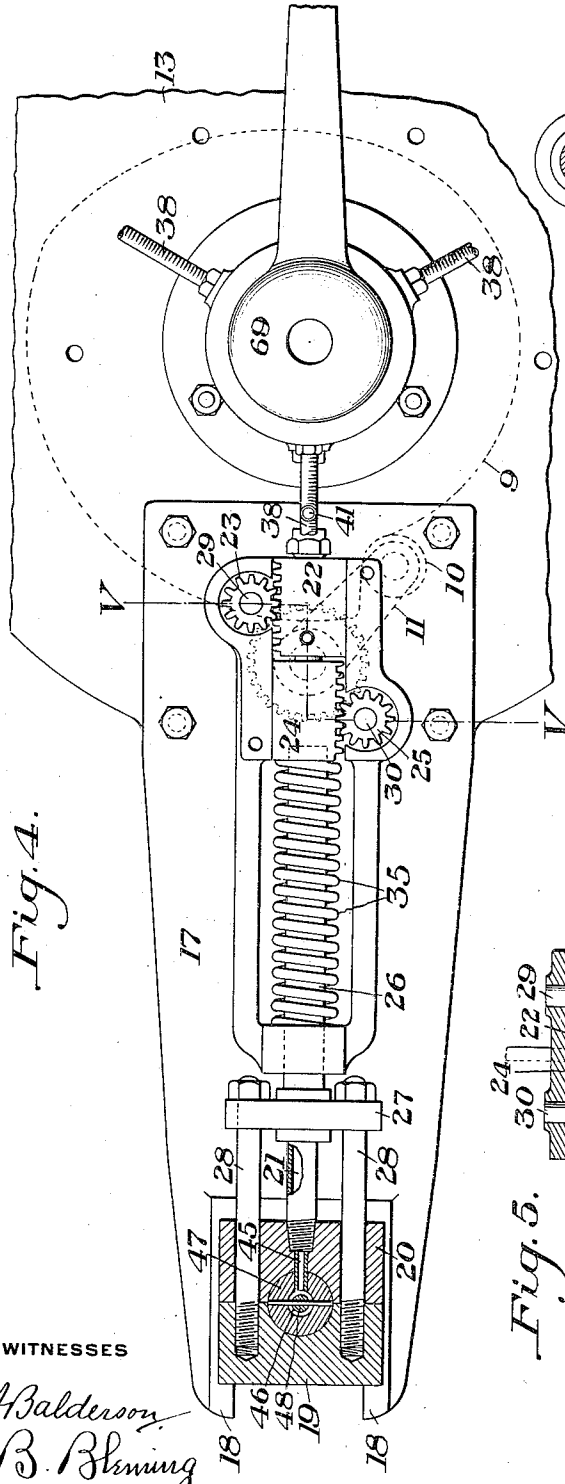

Fig. 4.

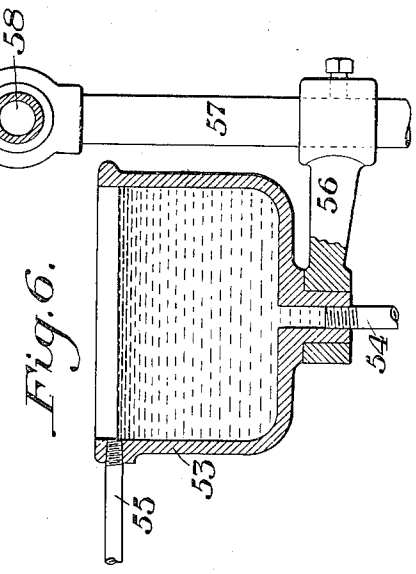

Fig. 6.

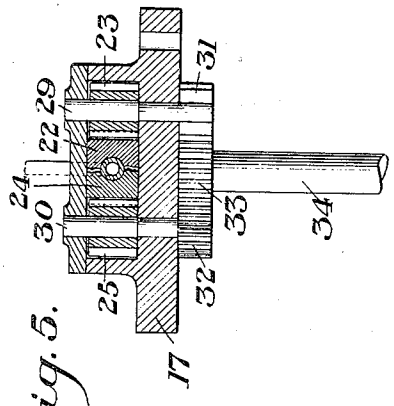

Fig. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

ALEXANDER L. SCHRAM, OF HILLSBORO, ILLINOIS.

GLASS-GATHERING MACHINE.

1,024,228. Specification of Letters Patent. Patented Apr. 23, 1912.

Application filed February 28, 1910. Serial No. 546,312.

To all whom it may concern:

Be it known that I, ALEXANDER L. SCHRAM, of Hillsboro, Montgomery county, Illinois, have invented a new and useful Glass-Gathering Machine, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view showing one form of my improved gathering machine; Fig. 2 is a sectional side elevation of the same; Fig. 3 is an enlarged section of the upper portion of the machine; Fig. 4 is a partial plan view on a larger scale than Fig. 1; and Figs. 5 and 6 are detail views hereinafter referred to.

My invention relates to the gathering of glass from a tank hearth or receptacle containing it.

The object of the invention is to gather measured batches of glass, and feed them to molds.

A further object is to provide a simple, compact and easily operated machine, in which suction may be employed to gather the measured batches and drop them in successive molds, preferably by the opening of the portions of the gathering cups.

In the drawings, 2 represents a vertical stationary shaft supported upon the diverging base frame having leg members 3. Through the upper part of this base frame extend rods 4 from the cross-head of plunger 5 of a hydraulic or air cylinder 6.

The upper ends of these rods, which are preferably reduced in cross-section are secured to a flange 7 of a sleeve or hollow shaft 8 surrounding shaft 2. This shaft 8 may be moved up and down by plunger 5, but does not rotate. On the flange 7 of hollow shaft 8 is secured a stationary cam plate 9, the cam on the edge of which is engaged by a roller 10 on the rock arm 11.

Supported on the cam plate 9 by a ball-bearing 12 is a turret 13 having bearings around the shaft 8 and rotatable thereon. To the lower end portion of this turret is secured the circular rack 14, which engages the longer teeth of a toothed wheel 15, the teeth of the rack remaining in engagement therewith in different vertical positions of the turret. The toothed wheel 15 is preferably engaged by a toothed wheel or actuating member represented at 16, formed as part of a glass molding machine carrying molds into which the glass is dropped by the gathering machine, as shown in dotted lines in Fig. 2.

To the upper part of the turret 13 are secured three radially extending arms 17, the outer ends of which arms are slotted or recessed to form side guides 18, on and within which slide the halves 19 and 20 of the gathering cups—there being one cup for each arm. These gathering cups when closed preferably form a gathering cavity, which in its lower portion has the shape of the inverted frustum of a cone, as shown in Figs. 2 and 3. This enlarging in cross-section upwardly forms a support for the gathered batch to prevent its dropping out.

The two halves of the cup are moved toward and from each other automatically and at the proper stations during the rotation of the machine. For this purpose I have shown the inner half of each gathering cup as actuated by a pipe or hollow rod 21 screwed into it and extending along the arm to a sliding rack 22 having teeth on one side thereof engaging a pinion 23, as shown in Fig. 4. In front of the sliding rack 22 and on the same level, is a separate sliding rack 24 having teeth on its opposite side engaging a pinion 25. The rack 24 is secured to a sleeve 26, to the outer end of which is secured cross-head 27 having bolts 28 extending through the inner half of the gathering cup and screwed into the outer half of the cup. The racks 22 and 24 and the cross-head 27 are suitably guided on the arm, and the pinions 23 and 25 are secured to vertical stub shafts 29 and 30, which project downwardly and carry at their lower ends pinions 31 and 32 engaging a toothed wheel 33 at the upper end of vertical shaft 34, to whose lower end is rigidly secured the rock arm 11. A spiral spring 35 surrounds the sleeve 26 and bears against rack 24, thus constantly tending to close the mold halves. The apex of the stationary cam 9 is so located that at each stop of the gathering machine the cup containing the previously gathered glass will open above the mold pressing or blowing machine, and then in the further movement will pass the apex of the cam, whereupon the roller 10 will drop down from the apex

as shown in Fig. 4 and through the gear connections allow the spring to close the cup.

In order to provide suitable sucking connections to draw the glass upwardly within the cup at the gathering station, I secure a ring 36 to the top of the turret, this ring having a vertical port 37 from which a flexible pipe or channel 38 leads through the rack body 22 and taps into the pipe 21. The port 37 when any of the arms is at the gathering station, is brought into registry with a vertical port 39 in a stationary ring 40, the port 39 having a suction pipe 41 connected to it and leading to any suitable source of suction. Above the stationary ring 40 is a washer 42 and a lock nut 43 secured to the hollow shaft 8. I have shown a spring 44 in the stationary ring 40 pressing upwardly on the side opposite to the port 30, and thereby tending to keep the joint between the ports 37 and 39 in close contact.

From the end of the suction pipe 21 a short nipple 45 leads through the inner half of the cup and into a vertical valve passage 46 within a removable plug 47. This plug is carried by the inner half of the cup when the two parts are separated, and within the valve passage 46 is located the valve stem of a valve 48 which controls its lower end. By using different lengths of plugs, I can measure the quantity of the glass which is gathered, since the sucking action will draw the glass in until it fills the cavity, the size of this cavity depending upon the length of the plug. In this manner by changing plugs, I can adapt the machine for different sizes and kinds of articles. The valve and stem are of such weight relative to the suction and size of passage that the valve will hang down in open position as limited by a cross-pin through it, until the glass sucked up within the cup strikes the lower end of the valve and pushes it shut. The suction will then stop and the glass will sink back slightly, as approximately shown in Fig. 3.

At the gathering station I preferably provide a knife or shear device 49, which is preferably arranged to move across the lower end of the cup and coact with it to shear off the glass from the batch. This knife may be pivotally mounted at 50 and provided with internal pipe-cooling connections leading to inlet and outlet pipes 51 and 52. The knife or shear may be under the control of the operator, and actuated by him, as desired.

At the third or cooling station I provide a vessel or receptacle 53 which contains water. The water may be kept at a constant level by an intake pipe 54 and an overflow pipe 55, a circulation of cooling water thus being produced. This open-top water receptacle may be supported by a bracket 56 secured on standard 57, which I have shown as forming part of a protecting frame 58 to ward off touching the machine from this side.

The cylinder 6 may be actuated by air from a pipe 59, having a control valve 60, which may be actuated by the operator as desired, or may be connected to the glass pressing or blowing machine in such a way as to actuate it at the desired intervals to raise and lower the turret and arms.

To adjust the height to which the plunger lifts, I have shown a cross-bar 61 passing through a vertical slot in the stationary shaft 2 and through side slots 62 in the shaft 8. This cross-bar is secured to the lower end of a central rod 63 having its end portion screw-threaded to engage the inner threads of a nut 64. This nut is secured to a bevel wheel 65 engaging bevel wheel 66 on the shaft 67, having at its outer end a hand wheel 68. The bevel gears are preferably inclosed by a casing 69. By turning the end wheel the cross-bars 61 will be raised and lowered, and act as a stop for the upward movement of the plunger 5.

In Fig. 1 I have lettered the three stations as follows:—The gathering station is lettered A; the discharge station B; and the cooling station C.

In the operation of the machine, it is rotated a third of a revolution, until the cups are brought to their proper stations, preferably by the movement of the glass molding machine. During this rotation the turret and arms are lifted, or in their upper position. When they reach their stations, the air is exhausted from the cylinder 6 and the three cups move down to a lower level. At this time the cup at the gathering station is connected with the suction supply, and glass is sucked up from the bath into which the lower end of the cup dips, until the cup cavity is filled. The shear is then actuated to cut off. At the same time the lowering of the turret brings the cup at station B down near a mold, and the cam opens the cup and allows the glass batch to drop into the open mold as indicated in Fig. 2. At the same time, at the third station the third cup is lowered into the body of water in the receptacle 53, thus cooling it so that it will be prepared for receiving the next batch. The rotation is in a clockwise direction, as the parts are shown in Fig. 1. When these operations are accomplished, air is admitted to the cylinder 6, the turret is lifted, and then turned a third of a revolution. In this turning operation, the cooled cup is closed before it reaches the gathering station. When it reaches the gathering station it in turn is connected with the suction supply; the next cup is brought to the cooling station, and

the filled cup is brought over the mold and opened.

The advantages of my invention will be apparent to those skilled in the art.

The glass is gathered and measured mechanically, and the amount of glass may be changed by merely changing the plugs in the cups, which is an easy and quick operation. The glass is positively dropped by the opening of the parts of the cup. The upwardly converging walls of the cup serve to support the mass of glass and prevent its dropping out when the suction is disconnected after leaving the gathering station. The lifting operation carries the cup with the gathered glass away from the bath, and the lowering brings one cup into contact with the glass of the bath from which it is gathered, another cup into the cooling receptacle, and the other cup near the mold.

The machine is simple, easily operated, and not liable to get out of order. The opening and closing of the cup parts are automatically carried out, as are also the connecting and disconnecting of the suction supply.

Many variations may be made in the form and arrangement of the machine and its parts without departing from my invention.

I claim:—

1. A suction gathering machine for glass having interchangeable plugs arranged to vary the amount of the measured batch; substantially as described.

2. A suction gathering machine for glass having interchangeable plugs arranged to vary the amount of the measured batch, each of said plugs having a valve passage through it; substantially as described.

3. A gathering cup having a suction passage, a changeable plug through which the passage extends, and a valve for the passage arranged to be closed by the entering glass; substantially as described.

4. A suction-gathering cup having a plurality of separable parts, connections for opening and closing the parts, and a removable plug forming a top for the cup, said plug by reason of its removability, whereby plugs of different thickness may be employed, providing means for varying the depth of the cup, substantially as described.

5. A suction gathering cup having an open bottom and made in two or more separable parts, mechanism for opening and closing the parts, a removable plug within the cup parts forming the top of the cup and removably attached to one of its parts, and a suction channel extending through said plug; substantially as described.

6. A suction gathering cup having an open bottom and made in two or more separable parts, a closing plug within the parts forming the top of the cup, a suction channel extending through the plug, and a movable valve in the plug adapted to be closed by the entering glass; substantially as described.

7. A suction gathering machine having a plurality of cups made in two or more parts, and mechanical connections operated by the movement of the gathering machine and arranged to automatically open and close the parts of the cup and drop the gathered batch from the cup during the movement of the machine; substantially as described.

8. A suction-gathering machine for glass having a carrier provided with gathering cups, each cup being made in a plurality of parts, connections arranged to automatically open and close said cup parts during the operation of the machine, a cooling station having a liquid tank, and connections arranged to move the cup relatively to the liquid tank to cool the cup at the cooling station, substantially as described.

9. A gathering machine having an endless carrier, a plurality of cups mounted thereon and made in separable parts, mechanism for automatically opening and closing said parts in the intermittent movement of the carrier, and mechanism for actuating the carrier, substantially as described.

10. A gathering machine having an endless carrier provided with gathering cups, each made in a plurality of parts, mechanism for automatically opening and closing the cup parts during the movement of the carrier, a cooling tank at the cooling station for the carrier, and mechanism for lowering the cups into the liquid tank at the cooling station, substantially as described.

11. In a glass gathering machine having an endless carrier provided with a series of cups, each made in a plurality of separable parts, mechanism for automatically opening and closing the cup parts during the movement of the machine, mechanism for raising and lowering the carrier, and adjusting mechanism for adjusting the extent of vertical movement, substantially as described.

12. In a glass gathering machine, an endless carrier having a plurality of suction-gathering cups with open bottoms, each cup being made in a plurality of separable parts, mechanism for opening and closing the cup parts during the movement of the carrier, and a mold-carrying machine connected with and arranged to drive the carrier of the gathering machine, substantially as described.

13. A glass gathering machine having a rotary carrier provided with a series of open bottom cups, each cup being made in a plurality of parts, a cooling station, a gathering station, and a dropping station within the path of the carrier, mechanism for intermittently rotating the carrier, and connections arranged to automatically open

the cups at the dropping station and close them for the gathering station, substantially as described.

14. A glass gathering machine having a rotary carrier provided with a series of suction cups having open bottoms, each cup being made in a plurality of parts, mechanism for opening and closing the cup parts during the movement of the machine, a cooling station having a liquid tank, and mechanism arranged to cause movement of the cups relatively to the tank at the cooling station to cool the cups, substantially as described.

In testimony whereof, I have hereunto set my hand.

ALEXANDER L. SCHRAM.

Witnesses:
J. R. HARKEY,
C. LUCILLE DAMMANN.