C. C. STUTZ.

PROCESS AND APPARATUS FOR WITHDRAWING GLASS FROM A CONTAINER.

APPLICATION FILED OCT. 17, 1911.

1,037,362.

Patented Sept. 3, 1912.

2 SHEETS—SHEET 1

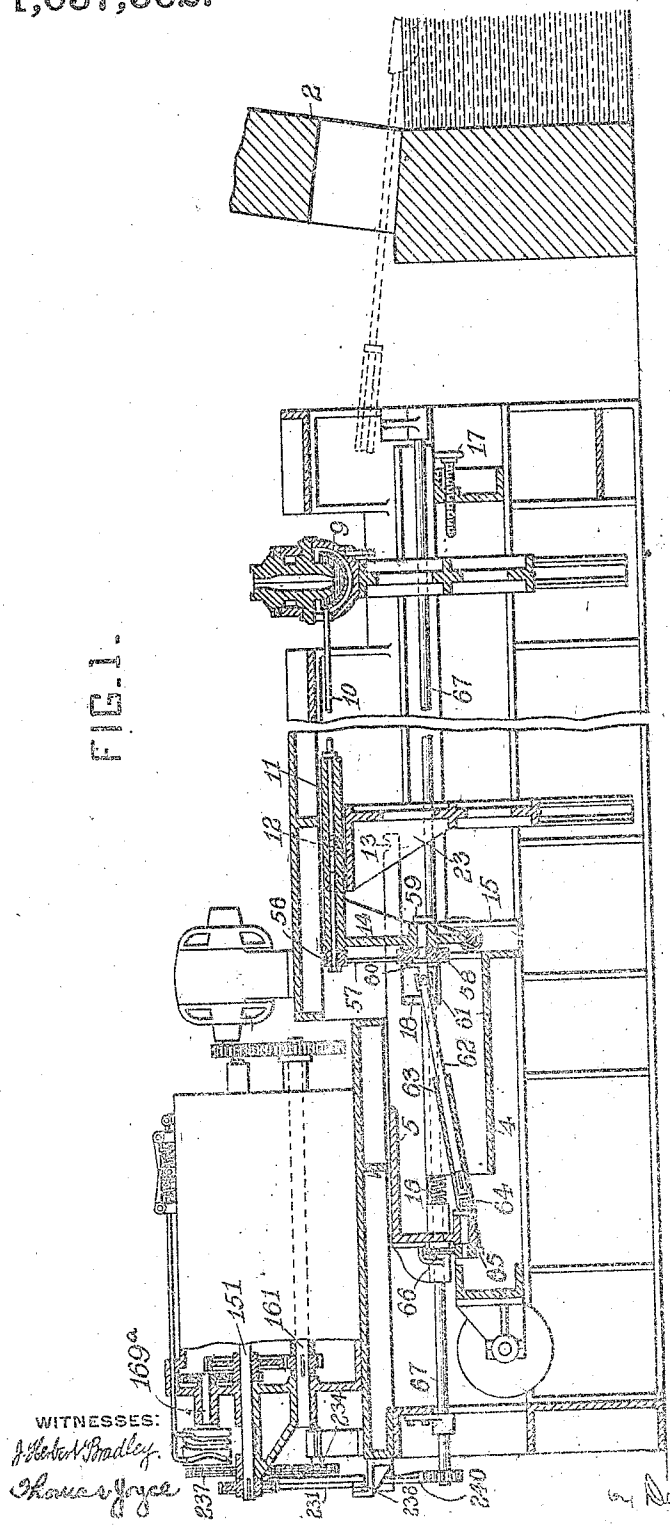

FIG. 1.

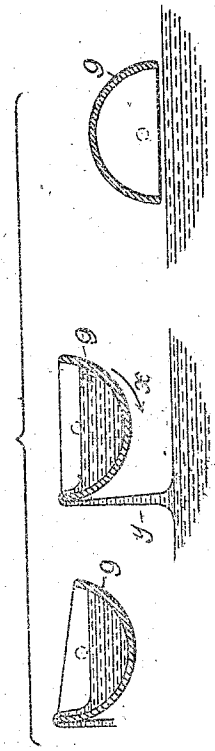

FIG. 4.

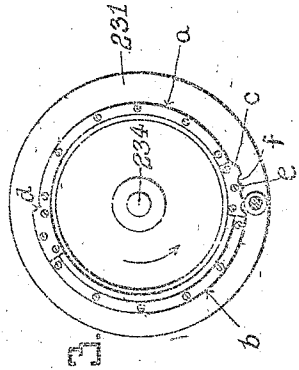

FIG. 7.

WITNESSES:

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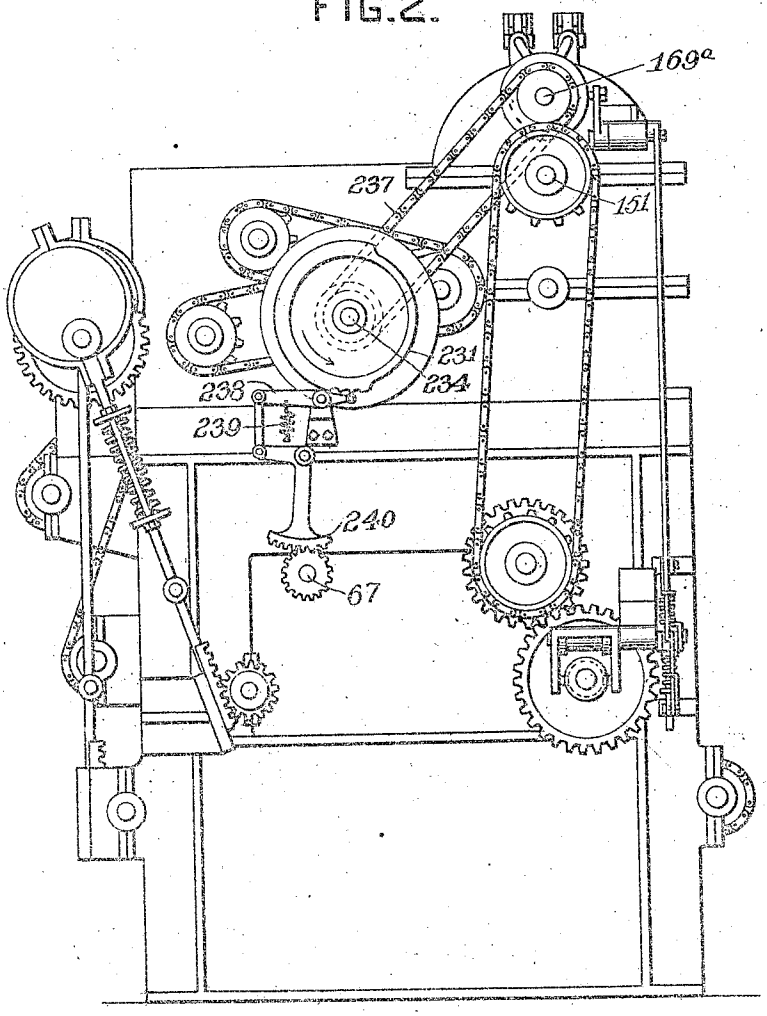
2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

CHARLES C. STUTZ, OF NORWOOD, OHIO.

PROCESS AND APPARATUS FOR WITHDRAWING GLASS FROM A CONTAINER.

1,037,362. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed October 17, 1911. Serial No. 655,341.

To all whom it may concern:

Be it known that I, CHARLES C. STUTZ, residing at Norwood, in the county of Hamilton and State of Ohio, a citizen of the United States, have invented or discovered certain new and useful Improvements in Processes and Apparatus for Withdrawing Glass from a Container, of which improvements the following is a specification.

On account of its lack of fluidity, difficulty is experienced in gathering glass especially when employing a ladle for that purpose. When the gathering tool is raised from the glass the mass carried by the tool is connected with that from which it is drawn, by threads or strings of glass, portions of which after they have been severed from the gathered mass or tool quickly harden. When employing a gathering rod, whether operated manually or mechanically, the rod is rotated after being raised from the glass thereby causing such a drawing out of these threads, while maintained at a high heat that they will break, and the ends be wrapped onto the mass adhering to the rod. While this method is efficient where rotatable tools such as rods, are employed, it is evident that such a method is not practicable when a container such as a ladle is employed.

The invention described herein has for its object such a manipulation of a ladle or other container while in the furnace or otherwise subjected to a high heat, as will cause the edge of the container to operate as a severing edge.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification Figure 1 shows in sectional elevation a glass forming machine embodying my invention; Fig. 2 is an end elevation of the machine; Fig. 3 is a face view on an enlarged scale of the cam for oscillating the ladle, and Fig. 4 illustrates the movements of the ladle to gather glass and to free it of surplus glass.

While for convenience my improvement is shown and described in connection with ladle operating and glass shaping mechanism set forth in Letters Patent Nos. 1,007,156 and 1,007,252 granted to me October 31, 1911, it will be understood that the improvements set forth herein can be employed in connection with other forms and construction of ladle-shifting and glass-shaping machines. As set forth in Letters Patent No. 1,007,156 the ladle 9 is carried by a rod 10, which is carried by suitable mechanism, whereby the ladle can be moved into a glass containing receptacle, be so moved while in the receptacle as to scoop up a quantity of glass, be withdrawn from the receptacle or furnace, and be moved into operative relation to glass-shaping means, where the contents of the ladle are discharged in any suitable manner.

In the construction shown herein, the rod 10 is rotatably mounted in a sleeve 11, which is provided with trunnions 12 adapted to be normally supported in notches 13 in a slide 5. As set forth in said patent the slide is carried by a lower slide 4, and is shifted back and forth by a screw. The sleeve 11 is provided at its rear end with an angularly disposed arm 14 extending down between vertically arranged guides 15 on the lower slide 4. While the slides 4 and 5 are in normal relation to each other, the sleeve 11 and rod 10 are held in horizontal position. The slide 4 is moved forward or in a direction to cause the ladle to enter the furnace by the slide 5, which operates on the slide 4 through springs 16. The return movement of the slide 4 is effected by a lug 18 on the slide 5 engaging the slide 4. While the slides are moving forward the sleeve and ladle rod are maintained in normal position, but at a suitable point in such forward movement, the slide 4 encounters a stop 17, while the slide 5 continues its onward movement. By this relative movement of the slide 5, the sleeve and rod 10 are so shifted as to cause the ladle to move down into or to a point closely adjacent to the surface of the glass. During these movements of the ladle the latter is in an inverted position, but as soon as it has been placed in proper relation to the glass, as stated, the ladle is turned causing it to scoop up a sufficient quantity of glass, and immediately following the filling of ladle, the slide 5 moves back to normal position relative to the slide 4, thereby restoring the sleeve 11 and rod 10 to normal position and lifting the ladle out of the glass and away from its surface, as described in the patent referred to.

While any convenient means may be employed for turning the ladle rod and ladle,

that shown in the patent referred to is preferred especially in connection with the type of machine set forth therein. On the rear end of the rod 10 is secured a drum 56 to which two straps 57 are attached, said straps passing in opposite directions around the drum to a second drum 58 loosely mounted on a stud 59 secured to the arm 14. A disk 60 is secured to the drum 58 and is connected by a universal joint 61 to one member of a telescopic shaft consisting of a rod 62 and a sleeve 63 keyed one to the other so as to rotate in unison but to move longitudinally independently one of the other. The sleeve 63 is connected by a universal joint 64 to a short shaft mounted on the rear end of the upper slide 5. A sprocket wheel 65 on the shaft is operatively connected by a chain to a corresponding wheel 66, so mounted on the shaft 67, which extends the full length of the machine, as to be rotated thereby but movable along the same by the slide 5.

A turning movement of the ladle through an arc of about ninety degrees is all that is required for scooping up the glass and discharging all or a remainder of the glass gathered, and by suitably proportioning the driving connections between the ladle rod and the shaft 67, the desired movements may be imparted to the ladle by a small angular movement of the shaft.

The angular movement of the shaft 67 may be effected through any suitable connections from the main drive shaft or any shaft driven therefrom as the shaft 169^a which is driven from the power shaft of the machine. Motion is transmitted from this shaft 169^a to the shaft 234 by a sprocket chain 237 or other suitable means, and on this shaft is secured a disk 231 having concentric surfaces *a* and *b* connected by cam surfaces *c* and *d*. One end of a lever 238 is held in contact with these respective surfaces during the rotation of the disk by a spring 239, while its opposite end is connected to a swinging segment 240 provided with teeth engaging a pinion in the shaft 67. The surfaces *a* and *b* are concentric but one is less in diameter than the other so that while lever 238 is held against one of these surfaces as *a* the ladle will be inverted. When the cam surface *c* reaches the lever 238 it will be shifted to bear on the surface *b*, and by this movement the ladle will be turned in the direction of the arrow *w* in Fig. 4, to scoop up a quantity of glass. The advancing edge of the ladle will as it emerges from the glass cause the formation of a strand *y* connecting the two bodies of glass. As the ladle is raised to holding position this strand will be drawn out but will not be broken and if the ladle be drawn at once from the furnace the strand will be further elongated and finally broken one portion dropping into the glass in the furnace, while the other will adhere to the ladle be drawn out and quickly chilled, in which condition it will greatly interfere with the subsequent treatment to which the glass is to be subjected. In order to avoid this objectionable feature provision is made for severing the strand at the edge of the ladle before any material chilling has occurred, so that the portion connected to the glass in the ladle will drop into the latter and become incorporated with the glass therein. While not limiting the invention herein as regards the broader features to the specific method and apparatus, the severing of the strand so that the portion adjacent to the glass in the ladle, can be incorporated therewith, can be conveniently effected by a to and fro movement of the edge of the ladle over which said strand is drawn. It will be readily understood that when the strand is drawn over the edge of the ladle the portions on each side of the edge will exert a pull tending to thin the strand at the ladle edge. When such edge is raised such thinning action will be accelerated. If now the edge be lowered the whole strand will drop and when the edge is again raised a further thinning will be effected at the point where the pull is exerted. A few of such to and fro movements will effect a complete severing of the strand at the ladle edge, and as the glass strand has been not only protected from any chilling, but on the contrary has been raised in temperature, as the temperature above the charge in the furnace is higher than that of the glass, the severed portions will drop into the furnace charge and the ladle respectively and become thoroughly incorporated. While not limiting the broader claims to such construction, as other means for oscillating the ladle within the spirit of my invention will readily suggest themselves to those skilled in the art, it is preferred to form alternate projections and depressions *e* and *f* in the portion of the surface *b* of the disk 231 adjacent to the cam surface *c*, (see Fig. 3) so that the desired to and fro movements will be imparted to the ladle immediately after it has scooped up the glass.

It will be understood that in the practice of my invention provision is made to prevent the adherence of the glass to the ladle. This result can be accomplished by cooling the ladle before it is inserted in the furnace or by employing a ladle formed of a material to which the molten glass will not adhere under the described conditions of use.

I claim herein as my invention:

1. As an improvement in the art of withdrawing glass from a furnace the method herein described, which consists in gathering a quantity of glass by a suitable tool, raising such tool above the surface of the glass in the furnace, drawing the strand extending from the gather over a suitable edge on the

tool, and moving such edge to and fro thereby severing the strand at that point while the tool is within the furnace.

2. As an improvement in the art of withdrawing glass from a furnace, the method herein described, which consists in scooping up a quantity of glass with a container, and imparting a to and fro rocking movement to the container while within the furnace and thereby separating any strands or threads extending from the glass in the container.

3. As an improvement in the art of withdrawing glass from a furnace the method herein described, which consists in gathering a quantity from the furnace charge by a receptacle having a surface to which the glass will not adhere and severing the strand connecting the gather to the glass in the furnace charge at such point that the severed portions will gravitate toward and become incorporated respectively with the gather and the furnace charge.

4. As an improvement in the art of withdrawing glass from a furnace, the method herein described, which consists in scooping up from the furnace charge a suitable quantity of glass by means of a container to which the glass will not adhere, and imparting a rocking movement to the container whereby the strand of glass extending over the edge of the container will be severed thereat and the portion connected to the gather will automatically become incorporated therewith.

5. In an apparatus for withdrawing glass from a furnace, the combination of a gathering tool, means for operating the tool to collect a suitable quantity of glass, and means for applying an intermittent transverse strain to the strand extending from the glass carried by the tool while the latter is within the furnace.

6. In an apparatus for withdrawing glass from a furnace, the combination of a ladle, means for causing said ladle to gather a quantity of glass, and means for rocking the ladle to and fro while in the furnace to apply a transverse strain to the strands connecting the glass in the ladle to the charge in the furnace.

7. In an apparatus for withdrawing glass from a furnace, the combination of a ladle, means for moving the ladle into and from the furnace, means for rotating the ladle to gather a quantity of glass, and means for rocking the ladle to and fro while in the furnace when charged with glass.

In testimony whereof, I have hereunto set my hand.

CHARLES C. STUTZ.

Witnesses:
JOHN E. MOLONEY,
A. B. MCAVOY.