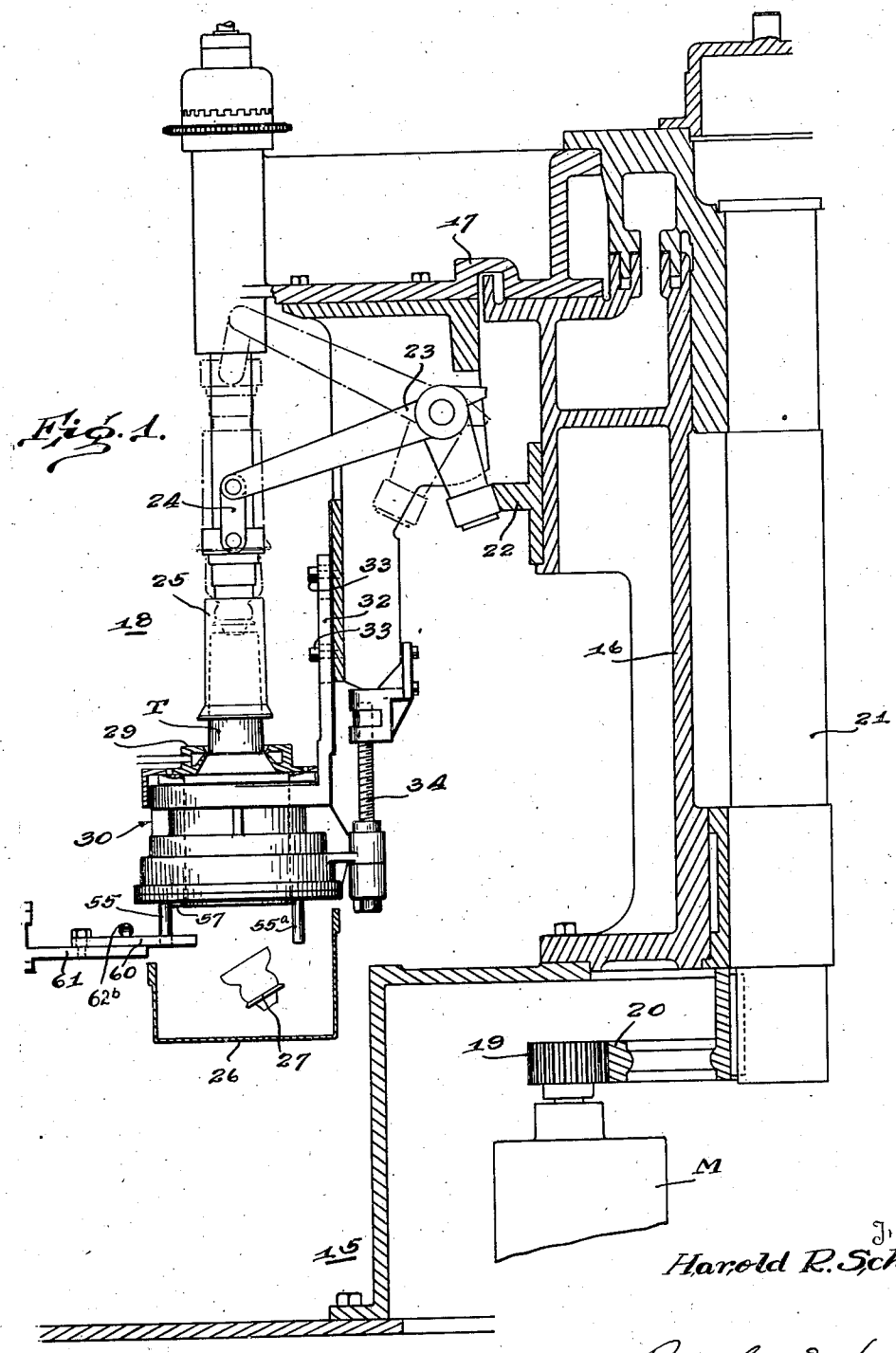
Aug. 7, 1945. H. R. SCHUTZ 2,381,467

APPARATUS FOR BURNING OFF GLASSWARE

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Fig. 1.



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Fig. 2.

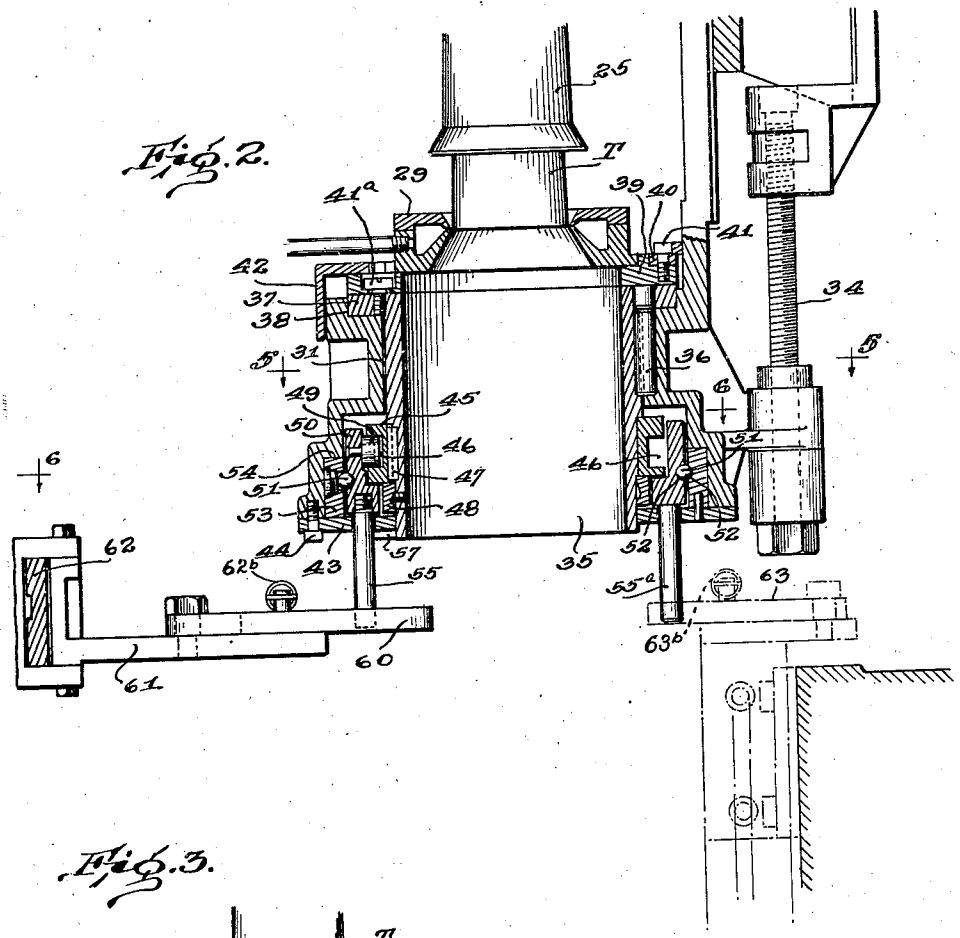


Fig. 3.

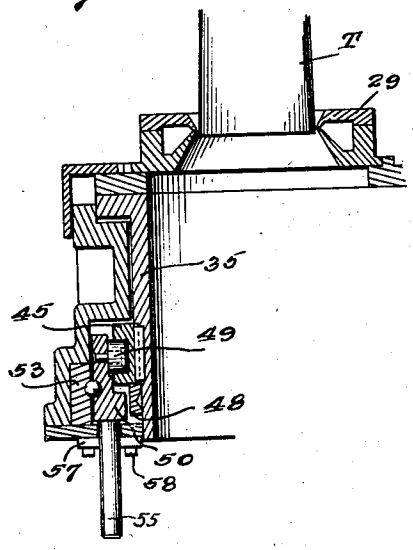
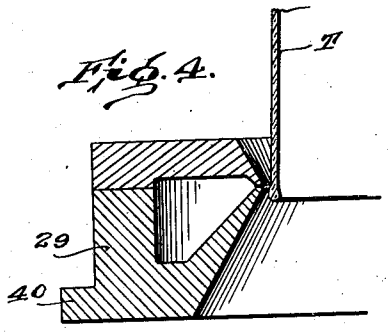


Fig. 4.



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APPARATUS FOR BURNING OFF GLASSWARE

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Fig. 5.

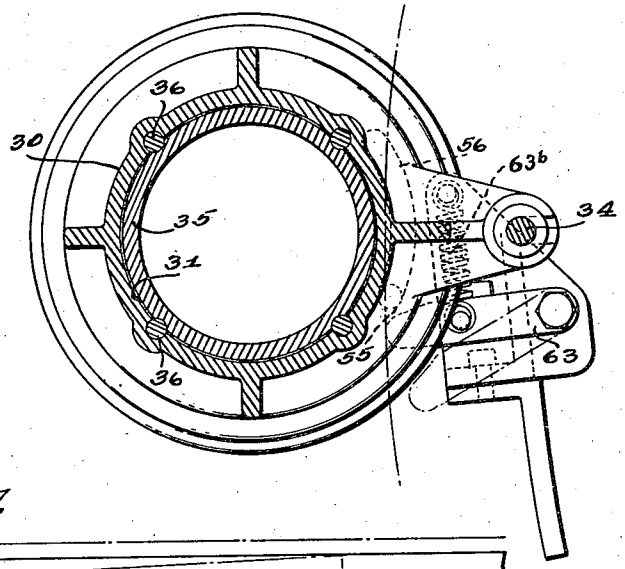


Fig. 7.

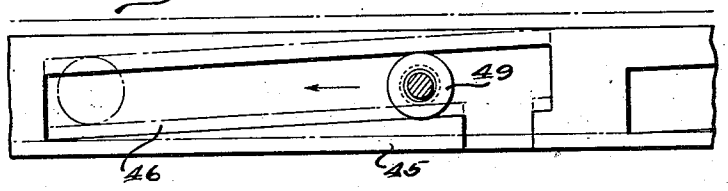
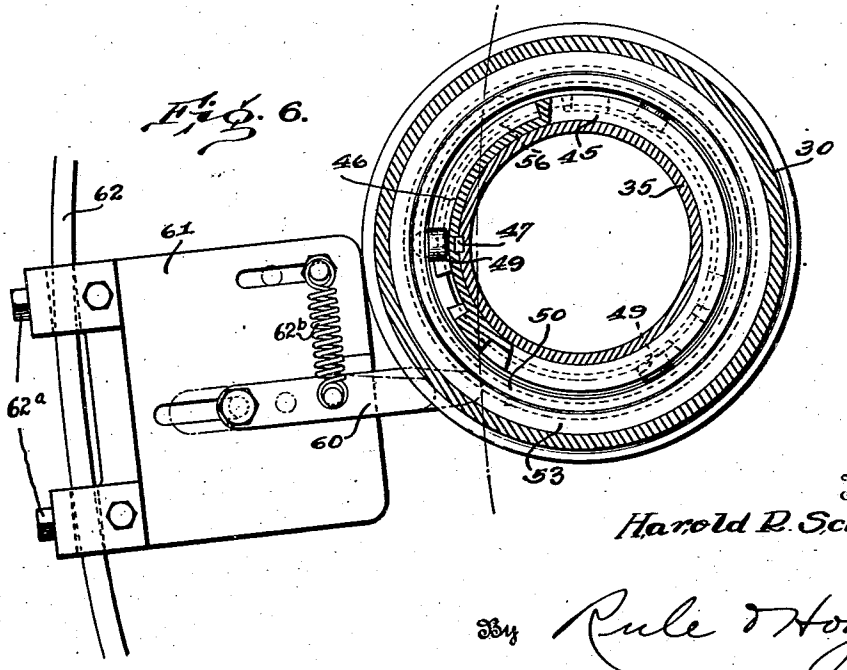


Fig. 6.



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APPARATUS FOR BURNING OFF GLASSWARE

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Fig. 9.

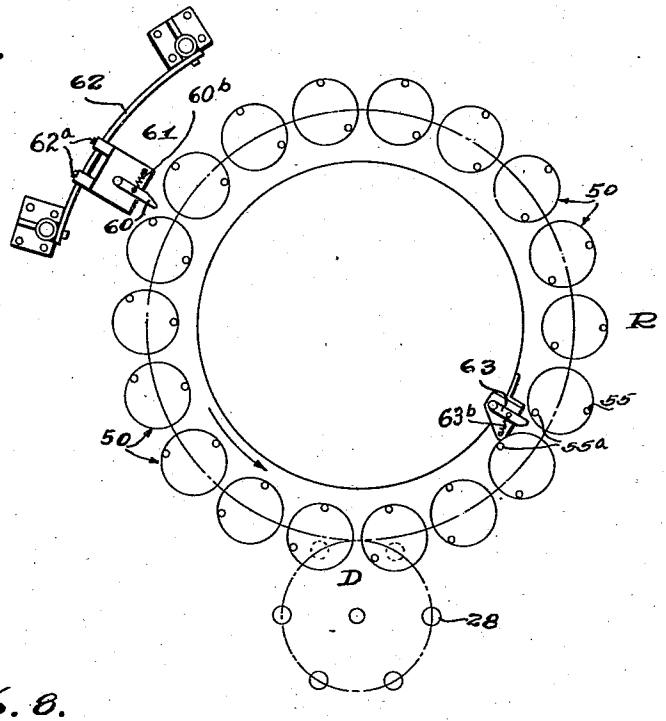
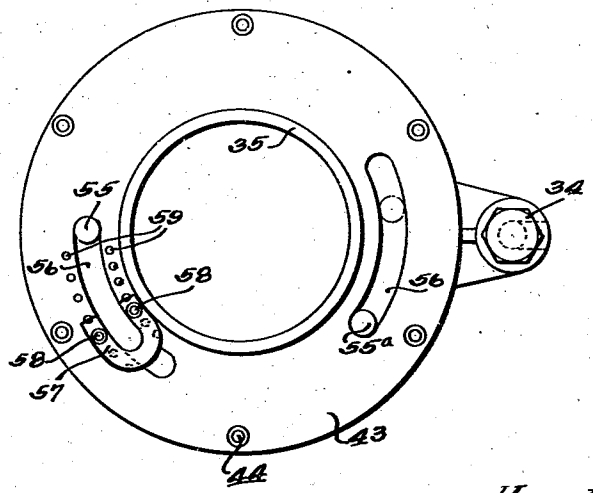


Fig. 8.



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UNITED STATES PATENT OFFICE

2,381,467

APPARATUS FOR BURNING OFF GLASSWARE

Harold R. Schutz, Toledo, Ohio, assignor, by mesne assignments, to Owens-Illinois Glass Company, Toledo, Ohio, a corporation of Ohio

Application August 13, 1942, Serial No. 454,636

12 Claims. (Cl. 49—50)

The present invention relates to improvements in apparatus for burning off glassware and more particularly is concerned with the formation of a bead or "safedge" at the rim of tumblers and like articles of tableware.

The principal object of my invention is the provision of a novel apparatus, through the use of which, the size of bead produced at the rim of a tumbler or similar vessel may be regulably controlled.

Another object of my invention is the provision of means individual to the burn-off units making up a complete machine, whereby each may be adjusted independently of the others to produce a specific and individual size of bead.

A further object is the provision of novel and easily operable apparatus for regulably controlling the size of bead produced.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is a side elevational view with parts in section illustrating the embodiment of my invention in an otherwise conventional rotary burn-off machine.

Fig. 2 is a vertical transverse sectional view of one of the burn-off units disclosing in some detail, the construction of the adjusting mechanism and showing the relationship between the tumbler and burner immediately after severance of the moil from the tumbler.

Fig. 3 is a fragmentary sectional view of the unit shown in Fig. 2, but disclosing the burner elevated slightly, preparatory to producing a bead on the rim of the tumbler.

Fig. 4 is a fragmentary detail sectional view of the burner and a portion of the tumbler during the formation of a bead on the latter.

Fig. 5 is a sectional plan view taken substantially along the line 5—5 of Fig. 2.

Fig. 6 is a sectional plan view taken substantially along the line 6—6 of Fig. 2.

Fig. 7 is a fragmentary side elevational view of one of three circumferentially spaced inclined cam faces and cooperating rollers which adjust the position of the burner.

Fig. 8 is a bottom plan view of one of the burn-off units showing an adjustable stop which limits vertical adjustment of the burner.

Fig. 9 is a diagrammatic plan view of a burn-off machine illustrating the relationship between the individual burn-off units and trip devices which alternately engage and operate the burner raising and lowering mechanism.

My invention is illustrated in conjunction with a conventional type of burn-off machine insofar as the main frame, carrier, and article holding chucks are concerned. These conventional parts include a base 15, a stationary central column 16 rising therefrom and supporting at its upper end, a rotary carriage 17 which in turn supports an annular series of burn-off units 18. The carriage is driven by means of a motor M operating through a pinion 19, ring gear 20 and vertical drive shaft 21, the latter extending upwardly through the stationary central column 16 and secured at its upper end to the rotary carriage 17. A stationary cam 22 attached to the upper portion of the central column 16, operates through a bell crank lever 23 and link 24 (Fig. 1) to impart vertical reciprocating movement to a chuck 25 which is intended to support a tumbler T or similar article of glassware in position for the moil severing operation. A moil pan 26 is arranged below the chuck to receive the moil 27 after it has been completely severed from the tumbler.

The burn-off units 18 (Figs. 1 and 9) are arranged in a circle about the central column 16, and are moved continuously by the mechanism described heretofore so that they travel in succession past tumbler receiving and discharging stations R and D respectively and through a moil severing zone located between said stations. At the tumbler discharging, or take-out station, the finished articles are placed upon a "peg" table 28 of conventional or any preferred type and from this table, are removed and transferred to an annealing leer (not shown).

Each of the burn-off units 18 comprises a ring-type burner 29 which is mounted upon a bracket 30, said bracket being generally cylindrical and provided with a central vertical opening 31 for a purpose which will be apparent presently. This bracket (Figs. 1 and 2) is attached to the rotary carriage 17 by means of a vertical arm 32 and bolts 33, the latter extending through slots in said arm and thereby providing for vertical adjustment to and securing of the bracket at any desired elevation. An adjusting screw 34 extending vertically alongside of the arm 32, and connected at one end to the carriage 17 and at its other end to said bracket 30, provides effective means for raising or lowering the bracket 30 and therewith, the burner 29. A cylindrical burner support 35 (Figs. 2, 3, and 5) is mounted in the opening 31 of the bracket 30 for limited vertical movement therein and is held against rotation in said bracket by means of pins 36. This cylindrical support (Fig. 2) has a flange 37

at its upper end extending radially outwardly and secured in a corner recess 38 of the bracket 30, and said flange in turn is secured to the burner 29 through the medium of a ring 39, flange 40 on said burner, and screws 41. Screws 41a secure the ring 39 to the flange 37 on said support. This specific structure is shown in Fig. 2 wherein there is also included a depending skirt 42 forming a part of the flange 40 on the burner, said skirt enclosing and having sliding contact with the upper portion of the bracket 30.

Mechanisms individual to the burn-off units are mounted each in the lower part of the bracket 30 and operable to move the burner 29 and cylindrical support 35 therefor, vertically relative to the tumbler chuck 25 as and for the purpose pointed out heretofore. To this end the lower portion of the cylindrical housing or bracket 30 is increased in diameter and provided with a bottom closure plate 43 which is attached to the bracket by means of screws 44.

The support adjusting mechanism comprises an annular series of cams 45 (Figs. 2, 6, and 7) which assume the form of a series of identically inclined circumferentially extending grooves 46, or cam surfaces, in a ring which encircles and is secured to the cylindrical support 35 by means of a key 47, or like element. A lock ring 48 (Figs. 2 and 3) serves to secure said cam against accidental displacement. Cam rollers 49 ride in these cams and are carried by an elevating ring 50 which encircles the retaining ring 48 and the cam for oscillation thereabout, and is held against vertical movement in the bracket by means of a series of retaining balls 51, the latter riding in mating annular grooves 52 provided in said elevating ring and a collar 53. This collar (Figs. 2 and 3) is secured between the aforementioned closure or cover plate 43 for the lower end of the bracket and a shoulder 54 substantially directly opposite the cam rollers 49.

For the purpose of imparting oscillatory motion to the elevating ring 50 whereby to move the burner vertically, I have attached to the lower side of said ring, a pair of substantially circumferentially spaced operating pins 55, 55a which depend from the ring and project through a pair of arcuate circumferentially extending slots 56 in said bottom closure plate 43. The pin 55 which functions as part of the burner raising mechanism is spaced radially outward from the other pin 55a with respect to the central column 16. These pins, as will be apparent presently, are intended to be engaged one at a time for moving the elevating ring in one direction and then reversing such motion in order to reciprocate the burner 29. The degree of circumferential movement of the pins and therefore the elevating ring, is limited by means of an adjustable abutment 57 (Fig. 8) which assumes the form of a substantially U-shaped element straddling one of the slots 56 and forming a false end wall therefor. This abutment is secured to the bottom closure plate 43 by means of screws 58 or similar fasteners which may be received in any of the several pairs of openings 59 arranged alongside of the corresponding slot 56.

In order that operation of the elevating mechanism may be effected automatically and at regular intervals, a yieldable finger 60 is so positioned externally of the circle of burn-off units as to engage one of the operating pins 55 of each unit at a given point in its cycle of operations and effect raising of the corresponding burner. This finger, upon engagement with one of the operating pins, exerts sufficient pressure thereon to cause circumferential movement of the elevating ring 50 a distance determined by the setting of the aforementioned abutment 57. The point at which such operation takes place is variable due to the mounting of the fingers upon a bracket 61 which in turn is slidable upon a horizontal carrier 62 and lockable thereon at any point by means of bolts or screws 62a, the latter being of arcuate form and extending in a direction circumferentially of the machine. A second finger 63 is positioned within the circle of burn-off units a short distance beyond the "peg" table 28 for engagement with the other operating pin 55a of each burn-off unit for the purpose of reversing the movement of the elevating ring and thereby returning the burner 29 to its original or lowermost position. Springs 60b and 63b have sufficient tension to hold the fingers 60 and 63 respectively and allow them to function as a fixed abutment, yet yield under a certain degree of pressure and permit the fingers to move out of the path of the pins with which they contact.

The operation of the above described burn-off machine may be described as follows:

An article of glassware, a tumbler for example, with the moil attached thereto, is positioned in the chuck 25 incident to operation of the raising and lowering mechanism for the chuck, and is so placed with respect to the burner 29 that an intensely hot flame is applied to the glass at the juncture of the tumbler and moil. This flame softens and ultimately completely severs the glass at this juncture, and the moil 27 drops into the moil pan 26. In order that a satisfactory bead, or "safedge," may be formed at the severed edge of the tumbler, the flame continues to play upon this edge, thereby causing the glass to roll into the shape of a continuous bead. In many instances and particularly where the tumbler is to be used initially as a food container and therefore sealed with an aluminum cap, or the like, a comparatively heavy bead is desired and in fact is absolutely essential to successful use with a cap. The size of the bead is increased by the step of moving the burner upwardly relative to the tumbler so that the flame plays not only upon the severed edge, but additionally impinges upon the glass in close proximity to said edge. This operation results in a heavier bead than is obtained by the usual method and has proved to produce a bead of uniform dimensions entirely free from humps and other irregular surface formations.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. Apparatus of the character described, comprising an annular series of burn-off units each including a holder for supporting a glass article and a moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, means for rotating the units about a vertical axis, mechanisms individual to the units for moving the burners vertically relative to the holder and devices common to all of said units for actuating the mechanisms at predetermined points in each revolution thereof about said axis, each of said mechanisms including a cylindrical support for the burner, said support being nonrotative about its own axis, a ring encircling the cylindrical support and mounted for oscillation thereabout, means holding said ring against vertical movement and cam and roller connection between said ring and support whereby circumferential move-

ment of said ring imparts axial movement to the support and burner.

2. Apparatus of the character described, comprising an annular series of burn-off units each including a holder for supporting a glass article and a moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, means for rotating the units about a vertical axis, mechanisms individual to the units for moving the burners vertically relative to the holder and devices common to all of said units for actuating the mechanisms at predetermined points in each revolution thereof about said axis, each of said mechanisms including a cylindrical support for the burner, said support being nonrotative about its own axis, a ring encircling the cylindrical support and mounted for oscillation thereabout, means holding said ring against vertical movement, cam and roller connection between said ring and support whereby circumferential movement of said ring imparts axial movement to the support and burner, and adjustable means for restricting the degree of circumferential movement of said ring.

3. Apparatus of the character described, comprising an annular series of burn-off units each including a holder for supporting a glass article and a moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, means for rotating the units about a vertical axis, mechanisms individual to the units for moving the burners vertically relative to the holder and devices common to all of said units for actuating the mechanisms at predetermined points in each revolution thereof about said axis, each of said mechanisms including a cylindrical support for the burner, said support being nonrotative about its own axis, a ring encircling the cylindrical support and mounted for oscillation thereabout, means holding said ring against vertical movement and cam and roller connection between said ring and support whereby circumferential movement of said ring imparts axial movement to the support and burner, said cam and roller connection including an annular series of cams mounted upon and externally of said cylindrical support and rollers individual to and cooperating with the cams mounted upon said ring.

4. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner spaced from and in axial alignment with the holder, a support for the burner, said support being nonrotative about the axis of the holder, means for moving the burner support axially including a ring encircling said support near its lower end and mounted for oscillation thereabout, means securing the ring against axial movement, and cam and roller connection between said ring and burner support.

5. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket and cam and roller connection between said support and ring whereby circumferential movement of the latter imparts axial movement to the support and burner.

6. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, a circumferentially extending cam fixed to and encircling the lower portion of the burner support and cam rollers carried by said ring and engaging the cam.

7. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, an annular series of circumferentially extending cams mounted upon the exterior of the burner support and cam rollers individual to said cams and carried by the ring cooperating with the cams.

8. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, cam and roller connection between said support and ring whereby circumferential movement of the latter imparts axial movement to the support and burner, a pair of operating pins depending from said ring at circumferentially spaced points and providing means whereby oscillatory motion may be imparted to said ring.

9. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, cam and roller connection between said support and ring whereby circumferential movement of the latter imparts axial movement to the support and burner, a pair of operating pins depending from the ring at circumferentially spaced points, providing means whereby oscillatory motion may be imparted to said ring, and means for limiting the possible extent of circumferential movement of said ring.

10. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket

having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, cam and roller connection between said support and ring whereby circumferential movement of the latter imparts axial movement to the support and burner, a pair of operating pins depending from the ring at circumferentially spaced points, providing means whereby oscillatory motion may be imparted to said ring, and means for limiting the possible extent of circumferential movement of said ring, said last named means including an adjustable abutment carried by the bracket and positioned at one end of the path of movement of one of said pins.

11. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, an annular series of cams mounted upon the exterior of the burner support, cam rollers individual to said cams and carried by the ring cooperating with the cams, a plate positioned beneath and cooperating with the bracket in enclosing the ring and cams, said plate having a pair of circumferentially spaced arcuate slots therein, and a pair of operating pins depending from the ring and projecting through said arcuate slots.

12. Apparatus of the character described, comprising a holder for supporting a glass article and moil integral therewith in superposed relationship, a ring-type burner positioned below and in axial alignment with the holder, a bracket having a vertical opening therein, a burner support slidingly and non-rotatively mounted in said opening, a ring supported in the bracket and encircling the lower part of said support for oscillation thereabout, means securing said ring against axial movement in said bracket, an annular series of cams mounted upon the exterior of the burner support, cam rollers individual to said cams and carried by the ring cooperating with the cams, a plate positioned beneath and cooperating with the bracket in enclosing the ring and cams, said plate having a pair of circumferentially spaced arcuate slots therein, a pair of operating pins depending from the ring and projecting through said arcuate slots, and an adjustabale abutment arranged at one end of one of said slots whereby to regulably control the degree of oscillation of said ring.

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