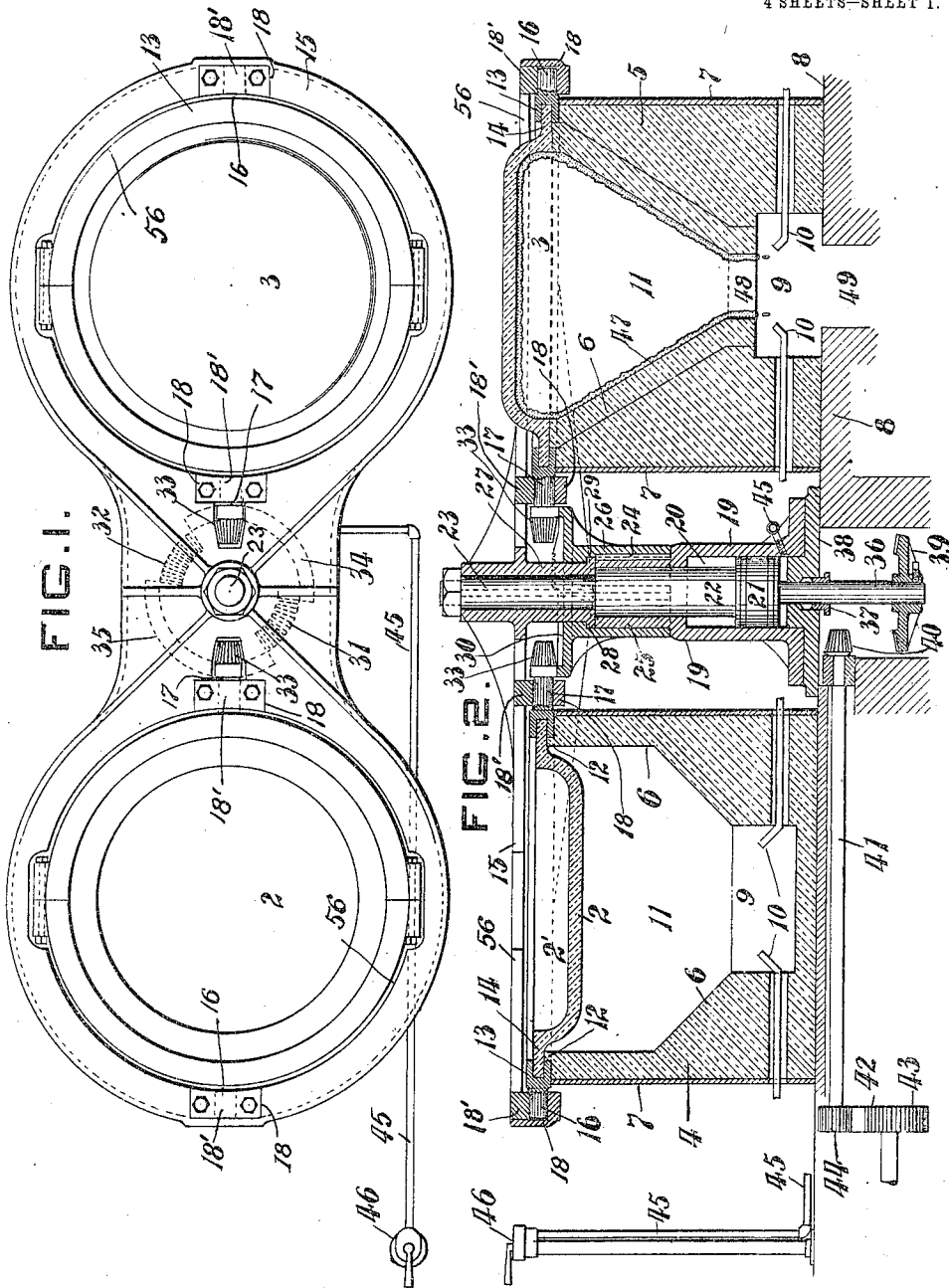


J. A. CHAMBERS.
 APPARATUS FOR HANDLING GLASS.
 APPLICATION FILED FEB. 23, 1911.

Patented Feb. 13, 1912.

4 SHEETS—SHEET 1.

1,016,933.



WITNESSES:

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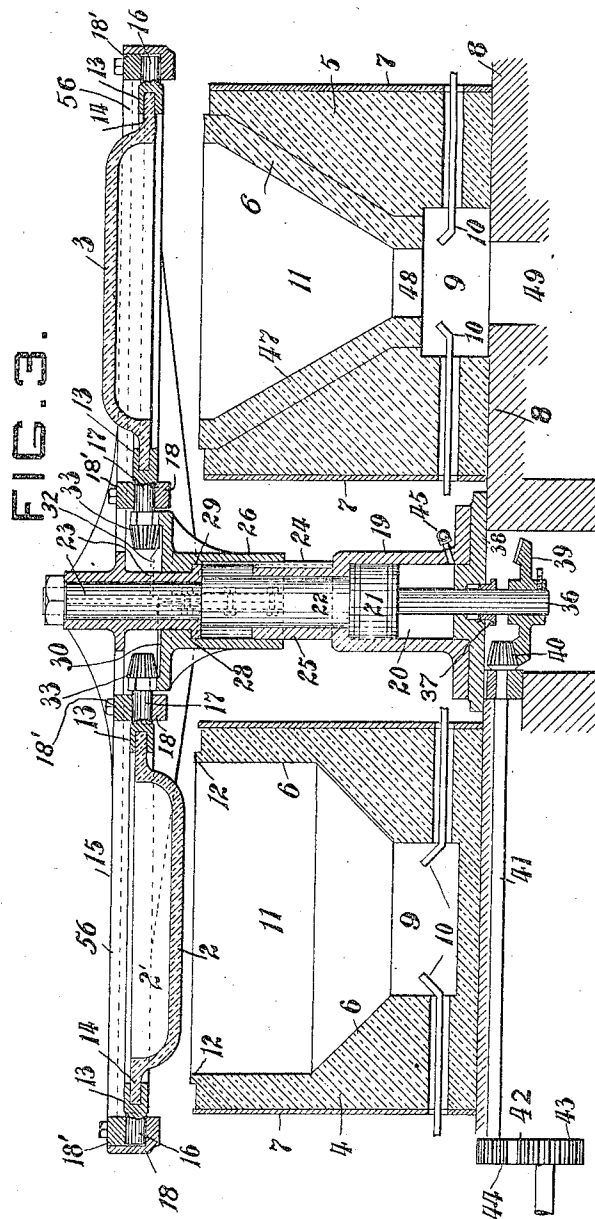
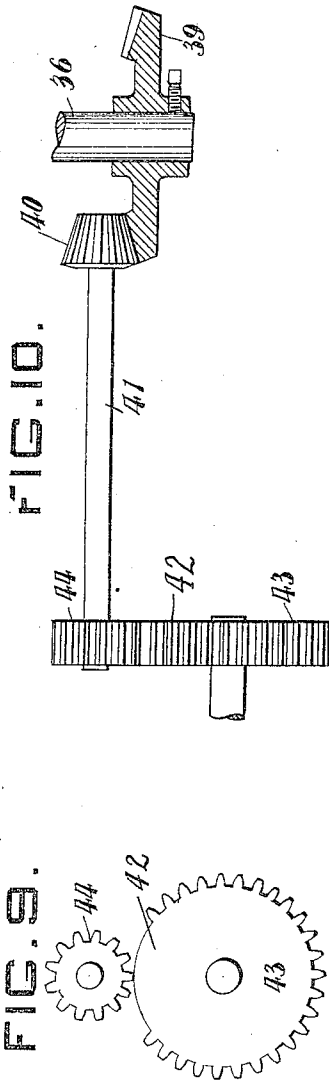
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4 SHEETS—SHEET 2.



WITNESSES:

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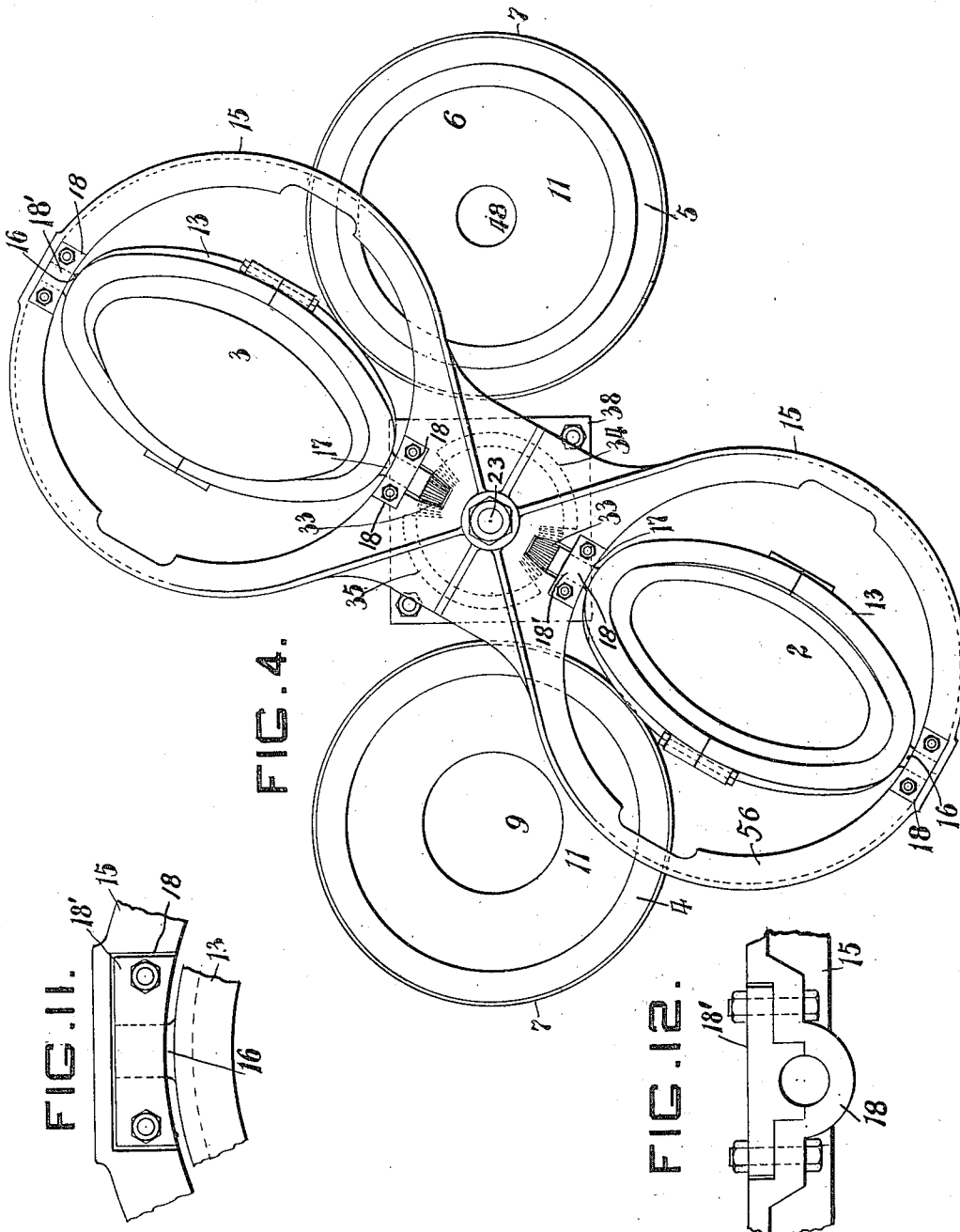
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4 SHEETS—SHEET 3.



WITNESSES:
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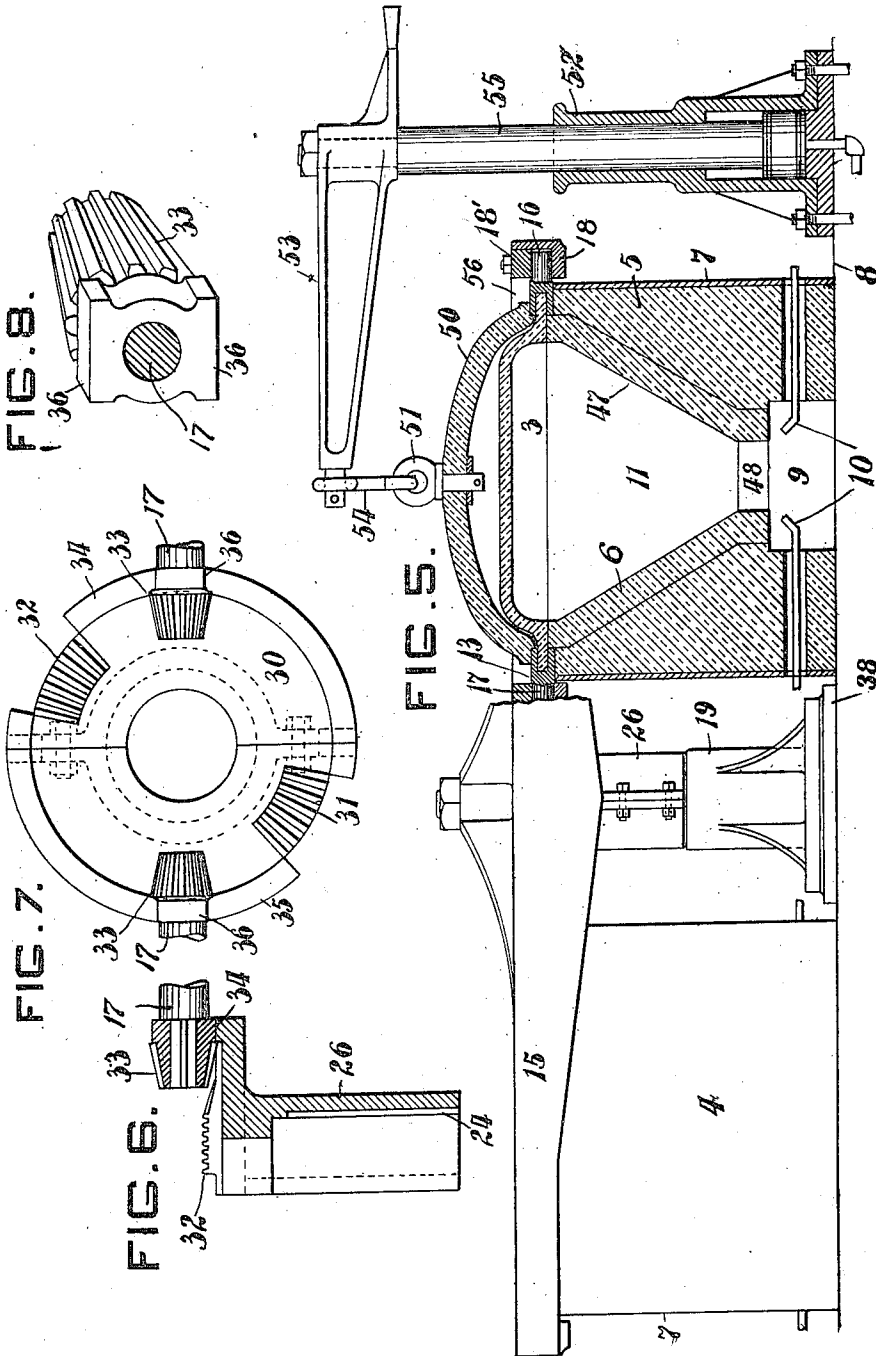
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4 SHEETS—SHEET 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES A. CHAMBERS, OF ALLEGHENY, PENNSYLVANIA.

APPARATUS FOR HANDLING GLASS.

1,016,933.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed February 23, 1911. Serial No. 610,422.

To all whom it may concern:

Be it known that I, JAMES A. CHAMBERS, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Handling Glass, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to apparatus for drawing glass in which pots or receptacles are employed to receive the glass preparatory to being drawn therefrom in the form of cylinders or sheets, and it aims to provide simple and improved means for mounting and manipulating the pots, the apparatus contemplating means for bringing the pot into position for reception of the glass to be drawn therefrom and means for effecting rotation of the used pot for draining therefrom of the remnant glass adhering to the pot cavity.

I will now describe my invention in connection with the accompanying drawings, so that others skilled in the art to which it appertains may understand and construct the same, it being understood, however, that the mechanism shown in the accompanying drawings is merely one embodiment of my invention, and may be varied without departing from the broad principle of the invention disclosed herein.

Figure 1 is a top plan view of apparatus embodying my invention; Fig. 2 is a vertical sectional view of the same; Fig. 3 is a similar view showing the support for the pot or pots in elevated position preparatory to turning of the support and revolution of the pots in their passage from one furnace to the other; Fig. 4 is a top plan view showing the support as being turned or rotated to transfer the pots from one furnace to the other; Fig. 5 is a side elevation partly in section and showing means for presenting to and lifting from the pot at the draining furnace, a heat retaining device or shield enveloping the bottom of the pot; Figs. 6 and 7 are respectively a detail sectional view and top plan view of the center of support, showing means for reversing the pots in their passage from one furnace to the other; Fig. 8 is a fragmentary perspective view of the gear carried by the trunnion of the pots; Figs. 9 and 10 are respectively an end ele-

vation and side elevation partly in section, showing gearing for rotating the support; and Figs. 11 and 12 are fragmentary top plan and elevational views respectively, showing the support bearings for the trunnions of the pots.

The preferable form of my apparatus, as shown in the drawings, is of a type in which the pots are presented to individual furnaces and the reference numerals 2 and 3 represent glass pots into which the glass is fed and from which it is drawn in the form of sheets or cylinders in the manner well known in the art.

The numerals 4 and 5 indicate two furnaces which may be circular or rectangular in form and which have the usual refractory lining 6 inclosed by the sheet metal casing or shell 7. These furnace bodies may rest upon any suitable refractory foundation 8 and have the bottom openings 9 into which lead the gas, oil or other fuel jets 10 which are directed upwardly or straight into the combustion chambers 11 of the furnaces.

Each of the drawing pots 2 and 3, when it is presented to the furnace 4 for the drawing operation, rests upon the top of the furnace in the manner shown in Fig. 2, the heat in the furnace chamber 11 below the pot keeping the pot with its molten glass fed thereto preparatory to drawing, warm and in proper condition for drawing of the glass therefrom. The seat for the pot, at the top of the furnace 4, is such as to effect a seal between the under face of the pot and the furnace body as the pot rests thereon, the refractory portion of the furnace having the upwardly projecting ledge or flange 12 which prevents the heat of the combustion chamber from reaching and destroying the metallic rings 13 carried by the pots 2 and 3. The ring 13 of each drawing pot receives and embraces or encircles the outwardly projecting or radially disposed flange-like portion 14 of the pot and constitutes means for revolvably mounting the pot in the table or support 15, which mounting is effected through the medium of the trunnions 16 and 17 carried by the ring 13 and which are received by the suitable split bearing 18 of the support 15. This ring 13 is preferably made in two parts for convenience of application to and removal from the pot.

A standard 19 interposed between and in diametrical alinement with the furnaces 4 and 5 has the cylindrical base 20 in which

operates the piston 21 fixedly carried by the vertical shaft 22. The shaft 22 is rotatably journaled in the standard 19 and has the reduced end 23 to which is fixedly secured the support or table 15. Keyed, as at 24, against rotation, to the upper sleeve-like portion 25 of the standard 19 is the vertically shiftable sleeve-like member 26 which, as shown in Fig. 7, is made in two parts and freely encircles the downwardly extending hub or sleeve portion 27 of the table or support, the member 26 having the annular shoulder or flange 28 which overlies the similar outwardly extending shoulder 29 of the hub 27 of the support. The upper table-like portion 30 of this member 26 carries the gear faces 31 and 32 which effect rotation of the beveled gears 33 fixedly carried by the pot trunnions 17 when the gears 33 are brought into mesh with the gears 31 and 32 as the table or support 15 is caused to be elevated by the piston 21 and then horizontally rotated over the furnaces, as will be described below, for transference of the pots from one furnace to the other. Also formed on the upper face 30 of the member 26 are the smooth-faced raised curved racks 34 and 35 which extend between the terminals of the gears 31 and 32 and over which the flat faces 36 of the gears 33 ride when they pass from the gears 31 and 32 in the rotation of the support 15. The shaft 22 also has the lower reduced portion 36' which passes through the stuffing box 37 of the base face-plate 38 of the standard 19 and cylinder 20. To the lower end of the shaft section 36 is fixedly secured the beveled gear 39 which is so positioned thereon as to be brought into mesh with the beveled gear 40 carried by the horizontal shaft 41, when the support 15 is elevated by the piston 21. The shaft 41 may be connected to any suitable source of power, for rotation thereof. This connection is preferably made through the intermediary of the mutilated-gearing arrangement 42 of such character that one revolution of the gear 43 thereof will bring about, through the gear 44, revolutions of the shaft 41, sufficient to give the vertical shaft 22 and consequently the support 15 a one-half revolution.

The numeral 45 indicates a suitable pipe for conveying compressed air or other operating fluid to the cylinder 19. This pipe 45 leads to, and connects with, the source of supply at the suitable controlling valve 46.

With the pot 2 in the position shown in Fig. 2, the molten glass may be ladled or otherwise fed into the pot cavity 2' preparatory to the drawing operation, the pot and glass being kept in a warm condition favorable to drawing of the glass, by the heat in the furnace 4. After the glass has been drawn, and it is desired to present a clean drawing pot and new batch of glass for an-

other drawing operation, the valve 46 is turned in such a manner as to feed the compressed air or other fluid into the cylinder 20, causing the piston carried by the shaft 22 to be forced upwardly. The upward travel of the piston 21 causes the shaft 22 to be shifted upwardly and the shaft in turn causes the table or support 15 carrying the drawing pots 2 and 3, to be elevated. This upward travel of the shaft 22 is of a distance sufficient to cause the drawing pots to clear the tops of the furnaces 4 and 5, thereby enabling the support 15 to be horizontally rotated by the shaft 22. As stated above, the elevation of the shaft 22 brings the gear 39 into mesh with the gear 40 whereby rotation of the support is effected. Such rotation of the support is clearly shown in Fig. 4. As the support passes from the furnaces in such a manner as to bring the pots out of superposed position therewith, the gears 33 of the pot trunnions 17, by this horizontal travel of the support 15, are caused to sweep across the gears 31 and 32 of the member 26 which has been elevated with the support, but which is prevented from rotating therewith, by means of the key and key-way 24. This travel of the gears 33 over the gears 31 and 32 causes the pots 2 and 3 to revolve on their trunnions 16 and 17, the pot 2 assuming a turned-over position with the pot cavity placed downward while the pot 3 which has, before the rotation of the support assumed this position with the cavity downward, is turned to an upright position preparatory to its positioning over the furnace 4; the pot 2, after turning downward, assuming, as the support continues to horizontally rotate, a position over furnace 5 simultaneously with the shifting of pot 3 into position over furnace 4, by reason of the fact that these two drawing pots are disposed in the support 15, in alinement with the furnaces. After the pots 2 and 3 have been turned by the partial rotation of the support, with the continued rotation of the support to bring the pots into their respective positions with the furnaces, and with the passage of the gears 33 from the gears 31 and 32, the straight-faced portions 36 of the gears 33 pass to the smooth-faced racks 34 and 35 which serve in conjunction with these faces 36 to prevent further rotation of the pots 2 and 3 after they have been turned in the manner above described.

With the release of the pressure from the cylinder 20 by turning the valve 46, the support 15 lowers, bringing the pots into seating engagement with the tops of the furnaces; the upright pot over furnace 4 and the downturned pot over furnace 5. As the downturned pot is received on top of the furnace 5 the heat of the furnace melts the chilled remaining glass adhering to the

cavity of the used pot, the melted glass flowing down the furnace wall 47, through the neck 48 to the suitable floor collecting passage-way 49.

5 It will be seen that the upper face of the refractory lining of the furnace 5 contacts with the refractory portion of the downturned pot at a point inside the pot ring 13, thus protecting this metal ring against destructive heating by the furnace.

10 During the draining of the downturned pot over furnace 5, it may be desirable at times to conserve the heat of the pot so that when it is placed over furnace 4 it will not require further preparatory heating. For this purpose I provide the dome or shield 50, as shown in Fig. 5, made of preferably refractory material and provided with the lifting eye 51 by means of which it may be presented to and removed from the pot.

15 When in position, this dome covers the upturned pot bottom and serves to prevent dissipation of the heat therefrom. Any suitable means may be employed for bringing the dome into and out of position. However, I have shown in the drawings the pneumatic jack 52 which has the arm 53 by means of which connection between this lifting jack and dome is made through the link arrangement 54. The vertical shaft 55 of the jack 52 is rotatably mounted so that after the dome is raised it may be shifted to one side of the furnace.

20 As shown in Figs. 11 and 12 the construction of the trunnion bearings 18 of the support 15 is such that the upper half 18' of each bearing may be removed and replaced from the top of the table or support, thereby permitting of the ready removal and replacement of the pots without disassembling the support or reaming mechanism.

25 While I have shown the support 15 as having openings 56 in which the drawing pots are mounted to revolve, it will be apparent, without necessity of specific illustration, that such support may be greatly varied.

30 Other changes may suggest themselves to the skilled mechanic, which would not depart from my invention and I do not therefore desire to limit myself to the specific form of apparatus shown; nor do I limit myself to any particular number of furnaces and pots which may be employed.

35 The advantages of my invention will be readily appreciated. The apparatus is small and compact and rapid and efficient in operation resulting in the expeditious drawing of the glass.

40 Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In glass handling apparatus, a furnace, a drawing pot, a horizontally rotatable support separate from the furnace for present-

ing the pot to the furnace, and means for revolubly mounting the pot in the support.

2. In glass handling apparatus, a furnace, a pot, a rotatable support separate from the furnace for bringing the pot into position with the furnace; the pot being revolubly carried thereby, and means for revolving the pot as it is brought to the furnace.

3. In glass handling apparatus, a furnace, a pot, a vertically shiftable, rotatable support for presenting the pot to the furnace, and means for shifting the support upwardly preparatory to presenting the pot to the furnace, and lowering the support in presenting the pot to the furnace.

4. In glass handling apparatus, a plurality of furnaces, a drawing pot, and means for presenting the pot to one furnace, in an upright position, and to another furnace, in a downturned position.

5. In glass handling apparatus, a plurality of furnaces, a drawing pot, means for bringing the pot from one furnace to another, and means for revolving the pot in a vertical plane as it is brought from one furnace to another.

6. In glass handling apparatus, a plurality of furnaces, a plurality of drawing pots, means for presenting successively the pots to one furnace, in an upright position, and to another furnace, in a downturned position.

7. In glass handling apparatus, a plurality of furnaces, a plurality of drawing pots, a support for bringing the pots successively from one furnace to another, and means for turning over the pots as they pass from one furnace to another.

8. In glass handling apparatus, a plurality of furnaces, a plurality of pots, a horizontally shiftable support for presenting the pots simultaneously to the furnace, and for bringing the pots from one furnace to another, the pots being revolubly mounted in the support.

9. In glass handling apparatus, a plurality of furnaces, a plurality of pots, a support for the pots, means for horizontally rotatably mounting the support, means for revolubly mounting the pots in the support, and means for effecting revolution of the pots by the rotation of the support.

10. In glass handling apparatus, a plurality of furnaces, a plurality of pots, a support for horizontally shifting the pots into position with the furnace, a standard for horizontally rotatably mounting the support, means for revolubly mounting the pots in the support, and means carried by the standard for engagement with and rotation of the pots.

11. In glass handling apparatus, a plurality of furnaces, a plurality of pots, a horizontally rotatably mounted support, a

journals carried by the pots whereby they are revolubly mounted in the support, and means for engagement with the journals for effecting turning of the pots.

- 5 12. In glass handling apparatus, a plurality of furnaces, a plurality of pots, a support for presenting the pots to the furnaces, a standard for horizontally rotatably mounting the support, journals carried by
10 the pots whereby they are revolubly mounted in the support, and means for engagement with the journals for effecting turning of the pots.

13. In glass handling apparatus, a plu-

15 rality of furnaces, a plurality of pots, a support for the pots, mounted to move in a horizontal plane to present the pots to the furnaces, journals carried by the pots, gears carried by the journals, and a gear for meshing with the journal-gears whereby rotation of the pots is effected. 20

In testimony whereof, I have hereunto set my hand.

JAMES A. CHAMBERS.

Witnesses:

M. A. KELLER,

MARY A. BARTH.