

977,685.

3 SHEETS—SHEET 1.



Elva Stanick

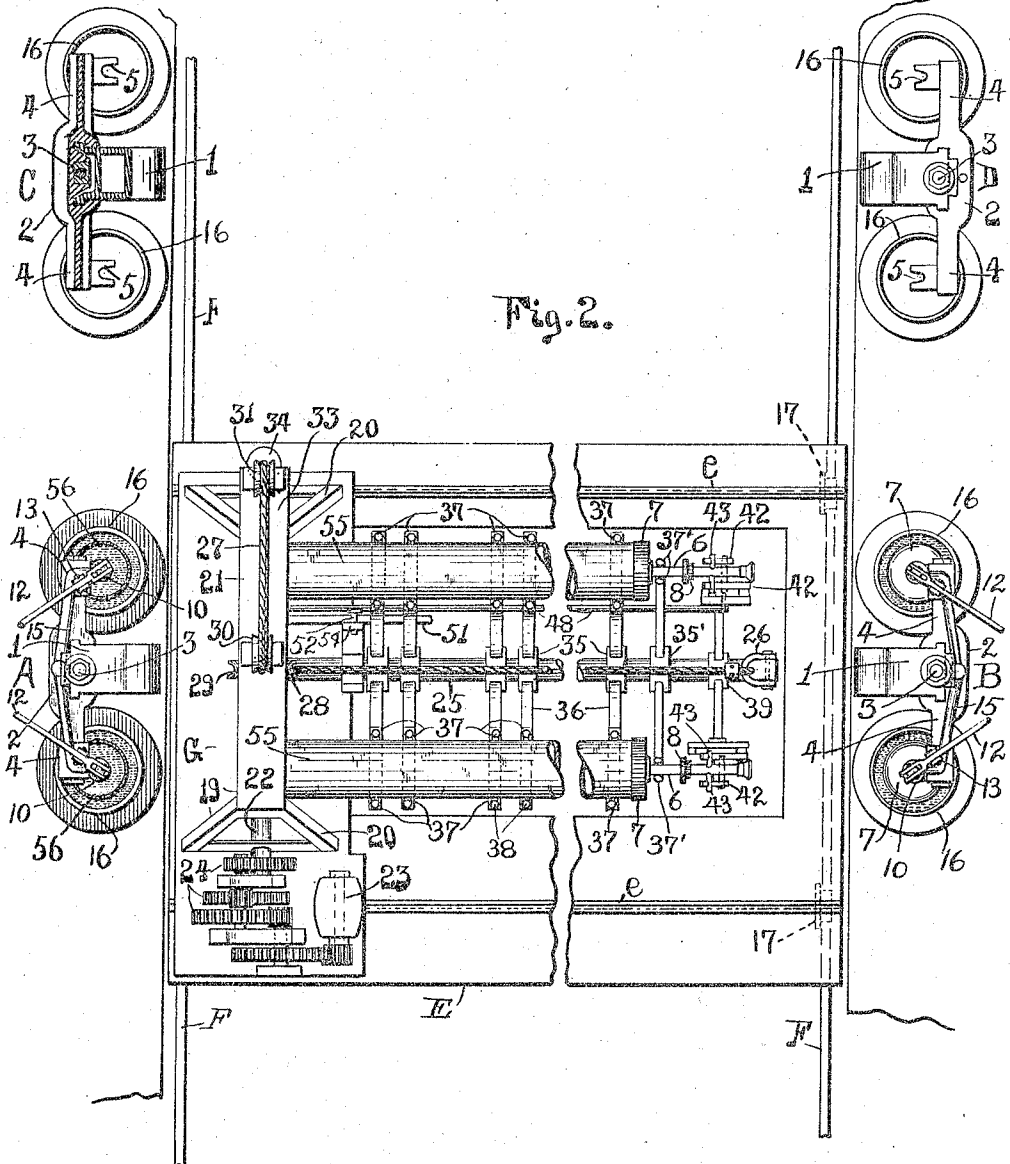
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ATTORNEY.

J. R. SPEER & G. H. HARVEY.
 MANUFACTURE OF DRAWN GLASS.
 APPLICATION FILED APR. 16, 1907.

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Patented Dec. 6, 1910.

3 SHEETS—SHEET 2.



Witnesses:
P. Mehard
Chas Stanick

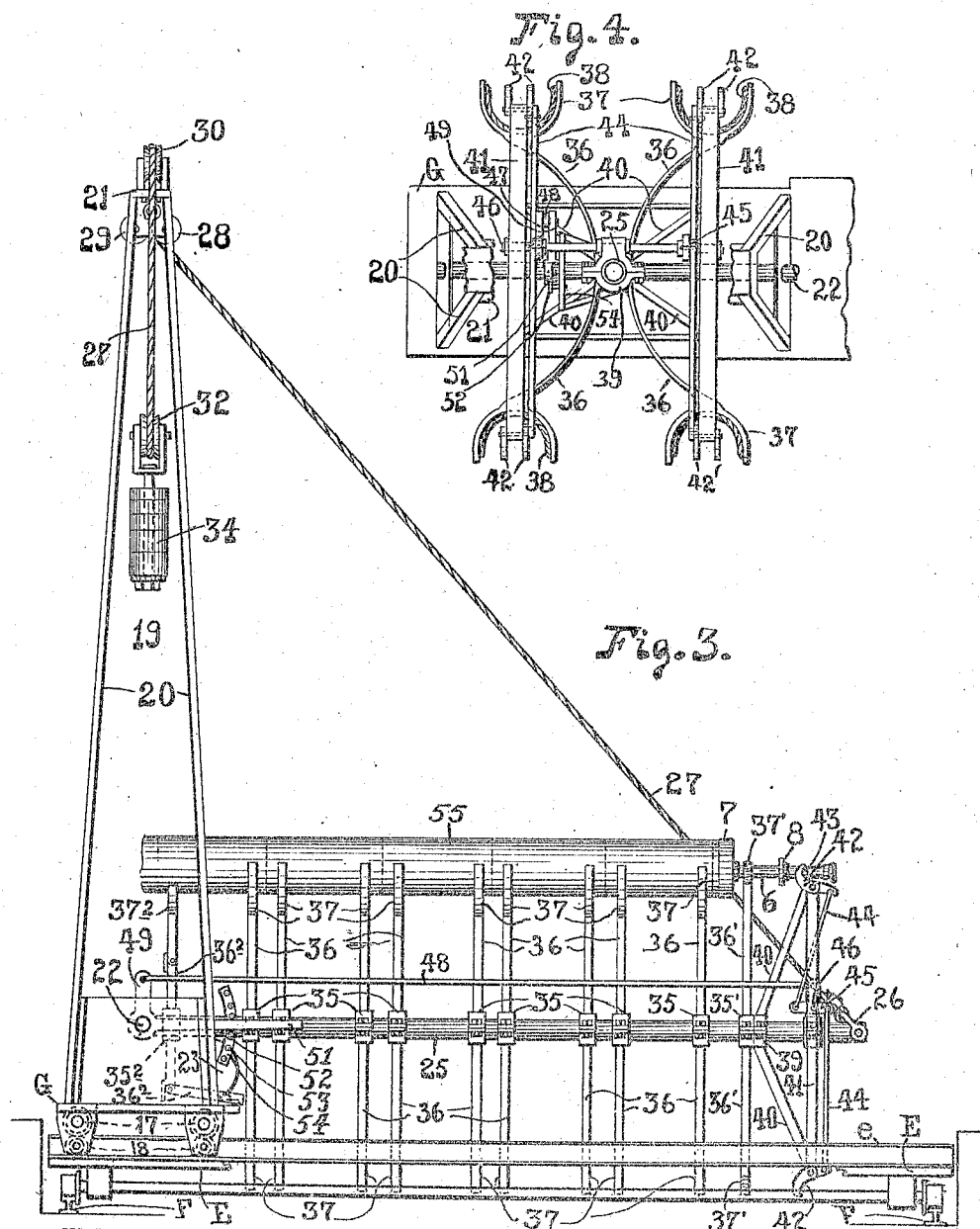
Inventors.
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WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES RAMSEY SPEER, OF PITTSBURG, AND GEORGE H. HARVEY, OF GLENFIELD, PENNSYLVANIA, ASSIGNORS TO BROWNSVILLE GLASS COMPANY, OF PITTSBURG PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MANUFACTURE OF DRAWN GLASS.

977,685.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed April 16, 1907. Serial No. 368,473.

To all whom it may concern:

Be it known that we, JAMES RAMSEY SPEER and GEORGE H. HARVEY, citizens of the United States, residing at Pittsburg and Glenfield, respectively, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in the Manufacture of Drawn Glass, of which the following is a specification.

Our invention relates to apparatus for drawing glass articles and for lowering the articles to a horizontal position, and has particular reference to the manufacture of glass cylinders; but it is not restricted to the same. Our glass lowering apparatus is designed to act in coöperation with parallel rows of duplicate drawing apparatus, in such a manner that any cylinder or pair of cylinders in either row may be detached from the drawing mechanism and lowered to a horizontal position. It is to be understood, however, that, although we show our apparatus particularly designed as specified, we do not restrict ourselves to the same, as our invention has marked advantages even when arranged to act in conjunction with an apparatus for drawing a single article.

Referring to the drawings which form a part of this specification, Figure 1 is a side elevation of our invention, broken away in parts and showing at the right the drawing apparatus with a cylinder at the initial stage of the drawing operation, and at the left the drawing apparatus with a cylinder at the conclusion of the drawing operation, the cylinder-lowering apparatus being in its vertical position. Fig. 2 is a plan showing the drawing operation completed at the pair of furnaces A and the cylinder-lowering apparatus with a pair of cylinders thereon in its horizontal position; the drawing operation about to begin at the pair of furnaces B; the drawing mechanism at the pair of furnaces C in section on the line 2—2 on Fig. 1; and the super-structure removed from the pair of furnaces D. Fig. 3 is a side elevation of the lowering apparatus looking to the right on Fig. 2. Fig. 4 is a plan of the lowering apparatus in its vertical position with its super-structure and operating means omitted. Fig. 5 is a detail in front elevation, with parts broken away.

Preferably we provide two parallel rows

of glass-drawing furnaces and lay a track parallel with and between said rows of furnaces. We preferably arrange our furnaces in pairs, the pairs in one row being opposite those in the other row. On said track we place a carriage having travel thereon at right angles to said track and carrying a device capable of receiving and lowering a pair of cylinders from any pair of furnaces in either row.

On Fig. 2, we have shown the two pairs of furnaces A and C in one row and the two pairs of furnaces B and D in the other row, the furnaces B and D being directly opposite the furnaces A and C.

E represents the truck having travel on the rails F parallel with the rows of furnaces, and G represents the carriage movable transversely of the truck on the rails.

The drawing apparatus is substantially the same as shown in our United States Patent, No. 813,248, dated February 20, 1906, except that it is modified so as to coöperate with a pair of furnaces instead of with one. Each drawing apparatus is preferably constructed as follows: Slidable vertically on the standard or column 1 is the carriage 2, which may be controlled in its movements by the screw 3, as in our said patent. The carriage has the oppositely extending arms 4, each having the front bracket 5, in the fork of which sits the hollow stem 6 of the drawing tool or bait 7, the stem having the collar 8 resting on the top of the bracket to cause the bait to travel up with the carriage but permitting the bait to be readily lifted off from the bracket. Each arm also carries the valve cylinder 10, in which slides the hollow connection 11, whose lower end fits air-tight in the upper end of the bait-stem 6. The connection 11 is reciprocated by the lever 12 pivoted on the post 13 and actuated by the chain 14 within reach of the operator of the drawing apparatus. Air is supplied through the pipe 15 to the connection 11, the stem 6 and the interior of the cylinder as they are drawn, as set forth in our patent hereinabove mentioned. The members of each pair of furnaces are arranged under the respective drawing apparatus, so that the center of each drawing pot 16 will be directly below the center of the bait 7 when suspended on the brackets.

The carriage G has the wheels 17 running

on the heads of the rails *c*, and the wheels 18 engaging the underside of the said heads to prevent the carriage from overturning. Other means may, however, be provided to secure the same result. The carriage G rigidly supports the tower 19, having the end standards 20 and the cross-piece 21, which connects together the tops of the standards. In the lower ends of the tower is a rock shaft 22 parallel with the rails F and actuated by the motor 23 through the intermediate reducing gears 24.

Rigidly secured to the shaft 22 is the mast 25, which when vertical extends up nearly to the top-piece 21 and has at its upper end the clevis 26. To the clevis is secured one end of the cable 27, which passes up between the two idlers 28 and 29 and then over the two idlers 30 and 31 on the top of the tower 19. From the idler 31 the cable passes beneath the wheel 32 and then up to the extension 33 of the top-piece 21. The wheel 32 carries the counterweight 34, which counter-balances the mast 25 and its appurtenances.

To the mast 25 is secured a number of collars 35, from each of which extend the four arms 36, the outer end of each arm having the fork 37. The forks are arranged with one pair on one side of the mast so as to partially embrace simultaneously a pair of completely drawn cylinders, the other pair of forks being on the opposite side of the mast and arranged to receive a pair of cylinders on the opposite side of the track F from those which the first named pair of arms may receive. The forks have linings 38 of some non-conductor of heat.

The top collar 35' has the four arms 36', and the forks 37', all the same as the parts 35, 36, and 37 except that the forks 37' are made small so as to receive and support the stem 6 of the bait.

A collar 35² near the bottom of the mast carries the jointed arms 36², having the cylinder-supporting forks 37², the joint permitting the outer sections of the arms to flex on the base of the carriage G as shown on Fig. 3. The joints are used because the arms are longer than the distance of the forks from the said base.

Above the collar 35' is the collar 39 having the arms 40, which support the parallel horizontal bars 41, extending at right angles to the columns 1. Each bar 41 has at each end a pair of levers 42 having one end adapted to engage the pin 43 extending out laterally from opposite sides of the bait stem 6, the opposite ends of the levers being pivoted to the end of the links 44. The remaining ends of the links are secured to the opposite ends of the levers 45 on the rock shaft 46. The links connected to all four of the levers 45 are connected to the rock shaft 46, which has the horizontal arm 47, which is connected by the link 48 to the arm 49 on the rock-shaft

22 mounted on the base of the tower. The arm 49 is actuated by the hand-lever 51, which may be locked in any desired position by means of the pin 52 and the holes 53 in the stop-plate 54.

The operation of our invention is as follows: Assuming that molten glass is contained in a pair of pots 16, the corresponding carriage 2 supporting a pair of drawing tools or baits 7 is lowered until the lower ends thereof are immersed in the glass, where they remain until the glass adheres to them. Then the carriage is raised and the two cylinders 55 drawn in the well known manner. After the cylinders have been drawn to the desired length, they are severed from the glass remaining in the pots, as shown in Fig. 1. Fig. 2 showing at the apparatus A the cut-off lower ends 56 of the cylinders in the pots.

The truck E and the carriage G are moved so that the left-hand pairs of forks on the mast are opposite the cylinders 55, the carriage G with the mast vertical is pushed to the left until the outer ends of the levers 42 pass beneath the pins 43 on the bait stems 6, the lever 51 is actuated so as to cause the levers 42 to lift the baits and cylinders off from the forked brackets 5. The chains 14 are now or have been actuated to raise the connector pipes 11 away from the bait stems 6. The lever 51 is then locked by the pin 52 placed in one of the holes 53. The motor 23 is then started in the proper direction to swing the mast with its load toward the right until it lies in a horizontal position, as shown in Figs. 2 and 3. During this operation the cable is drawn against the idler 28, and the lower arm 36² flexes as shown in Fig. 3. The cylinders are now horizontal and may be cracked off from the bait and elsewhere at the dotted lines, Fig. 3, the cylinder-supporting arms 36 being arranged in pairs along the mast so that when the cylinders are cracked off between the members of the several pairs the ends of the sections will be supported on the arms of adjacent pairs. The collars on the mast being made in sections bolted together, may be adjusted along the mast so as to support the cylinders at any desired place.

After the removal of the cylinders and baits from the lowering machine, the motor is reversed and the machine raised to the vertical position. The lever 51 is returned to its starting position so as to lower the outer ends of the lifting levers 42. The lowering mechanism may be shifted so as to lower the two cylinders which will by this time be fully drawn at the apparatus B. The operation described is repeated. The lowering mechanism is arranged so as to cooperate with any of the drawing apparatuses in either row.

Obviously our invention may be con-

structed for a single drawing apparatus for single cylinders. Various other modifications may be made within the spirit of our invention.

5 We claim—

1. In the manufacture of vertical drawn glass, two glass drawing apparatuses, means located between said drawing apparatuses and movable from one to the other for supporting the drawn articles, and means for lowering said article-supporting means movable away from each drawing apparatus with an article thereon to a horizontal position.
- 15 2. In the manufacture of vertical drawn glass, two glass drawing apparatuses, a carriage located between the same and movable from one to the other, a mast on said carriage, means on said mast to support a drawn article, and means for lowering the mast in different directions to a horizontal position.
- 20 3. In the manufacture of vertical drawn glass, two glass drawing apparatuses, a carriage located between the same and movable from one to the other, a mast on said carriage, means on said mast to support a drawn article, and means for lowering the mast away from either drawing apparatus to a horizontal position.
- 25 4. In the manufacture of vertical drawn glass, two parallel lines of glass drawing apparatus, a truck movable between said rows, a carriage on the truck movable at right angles to the movement of the truck, a mast mounted to swing away from either of said rows, means on said mast for supporting drawn articles, and means for swinging the said mast in either direction to a horizontal position.
- 30 5. In an apparatus for the manufacture of vertical drawn glass, two lines of glass drawing apparatus, a truck movable between said rows, a carriage on the truck movable at right angles to the movement of the truck, means on the carriage for supporting and lowering to a horizontal position the articles drawn from any of said drawing apparatuses.
- 35 6. The process of manufacturing glass objects which consists in lowering a bait into a bath of molten glass, raising the bait from the bath, causing the attached glass to be

drawn into an article, detaching the article from the bath and supporting the bait and drawn glass while vertical on a lowering device, causing a relative vertical movement between the bait and the bait lifting means to free the former from the latter, and lowering the article and bait to a horizontal position while supported by the said lowering device.

7. In an apparatus for the manufacture of vertical drawn glass, means for drawing vertical glass articles, a support adapted to move from a vertical to a horizontal position, a series of arms arranged in pairs on said support, and adapted to receive and support the side of the article as it is lowered on said support to a horizontal position.

8. In an apparatus for the manufacture of vertical drawn glass, means for drawing vertical glass articles, a support adapted to move from a vertical to a horizontal position, a series of adjustable arms arranged in pairs on said support, and adapted to receive and support the side of the article as it is lowered on said support to a horizontal position.

9. In apparatus for drawing cylinders, the combination with drawing means, of a bait provided with a hollow handle, the means for detachably engaging the hollow handle with the drawing means, and shifting means for detachably engaging the handle and the cylinder, and carrying the cylinder to a substantially horizontal position.

10. In apparatus for drawing cylinders, the combination with drawing means, of a bait provided with a hollow handle carrying a collar, means for detachably engaging the hollow handle with the drawing means, and shifting means provided with a fork for engaging the said collar and with other means for engaging the cylinder and adapted to carry the cylinder from vertical to substantially horizontal position.

Signed at Pittsburg, Pa., this 30th day of March, A. D. 1907.

JAMES RAMSEY SPEER
GEORGE H. HARVEY.

Witnesses:

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CLYDE BROOKS.