

No. 636,590.

Patented Nov. 7, 1899.

J. C. TRIANCE.

PASTE MOLD GLASS BLOWING MACHINE.

(Application filed Feb. 16, 1899.)

(No Model.)

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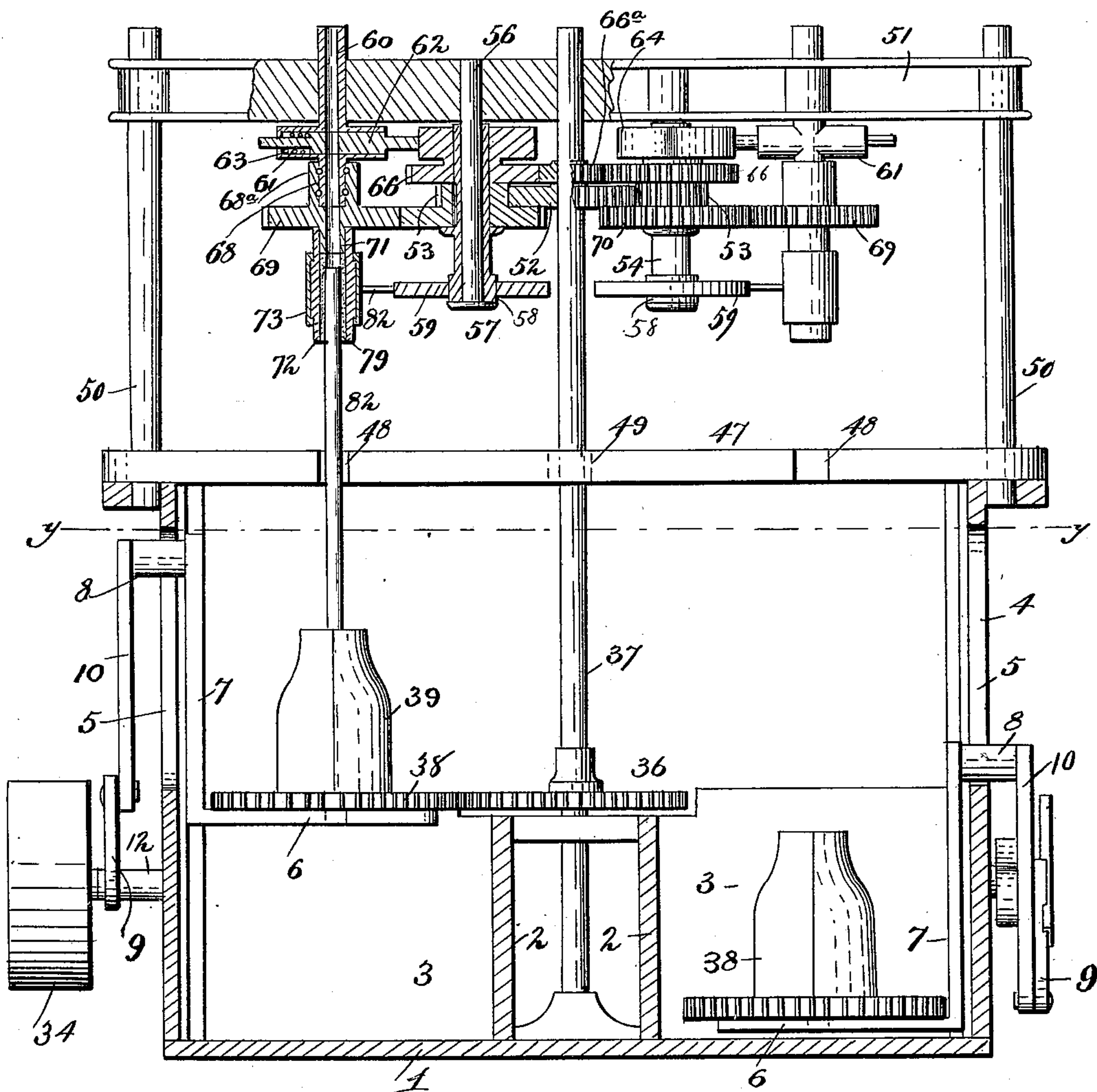


Fig. 1.

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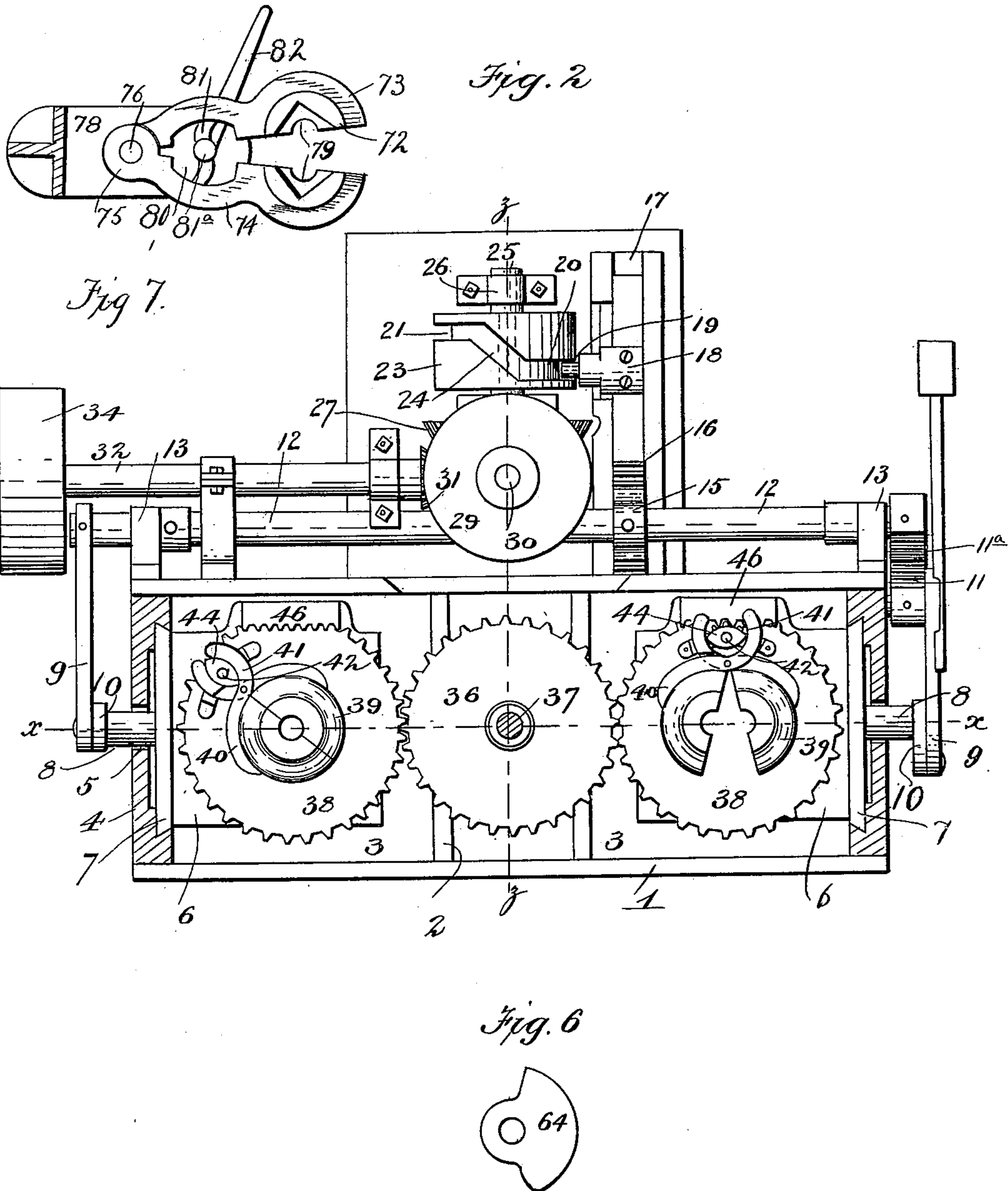
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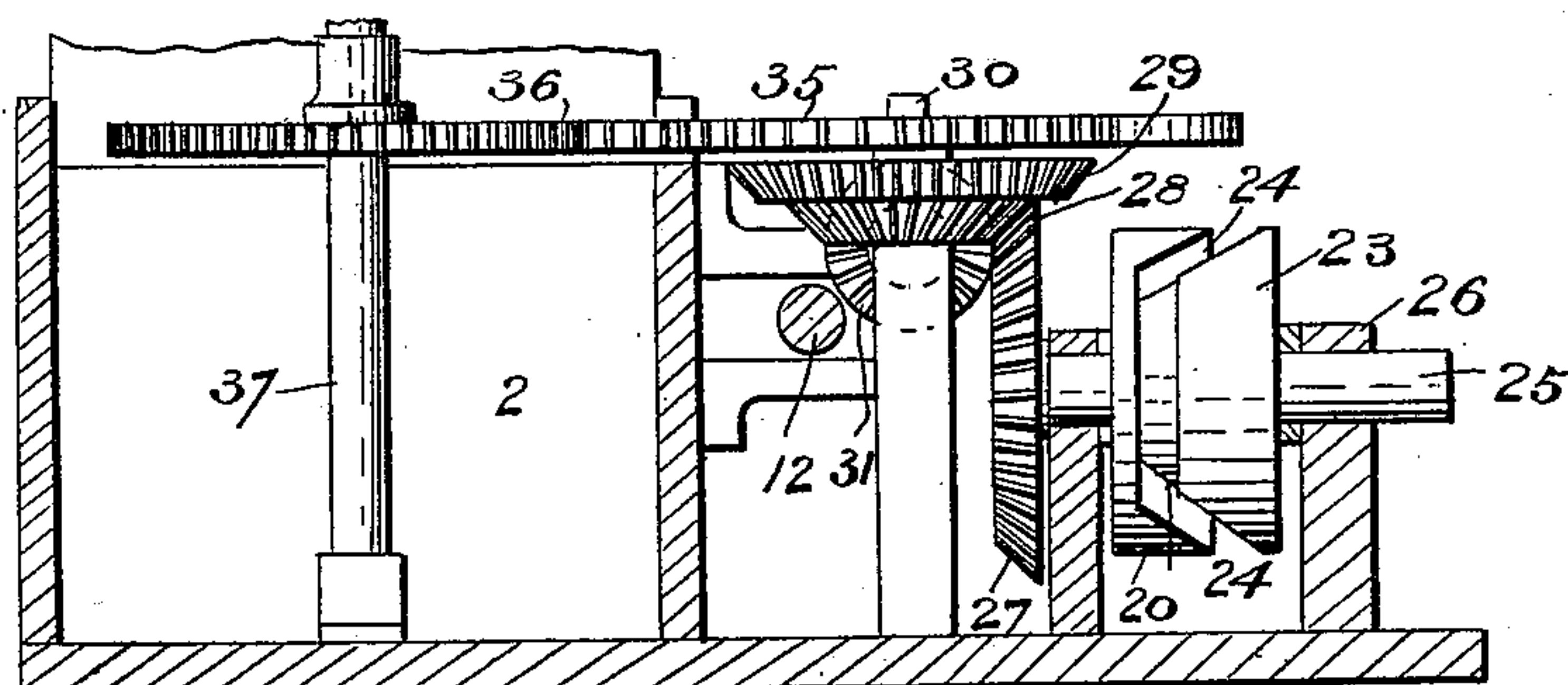


Fig. 3

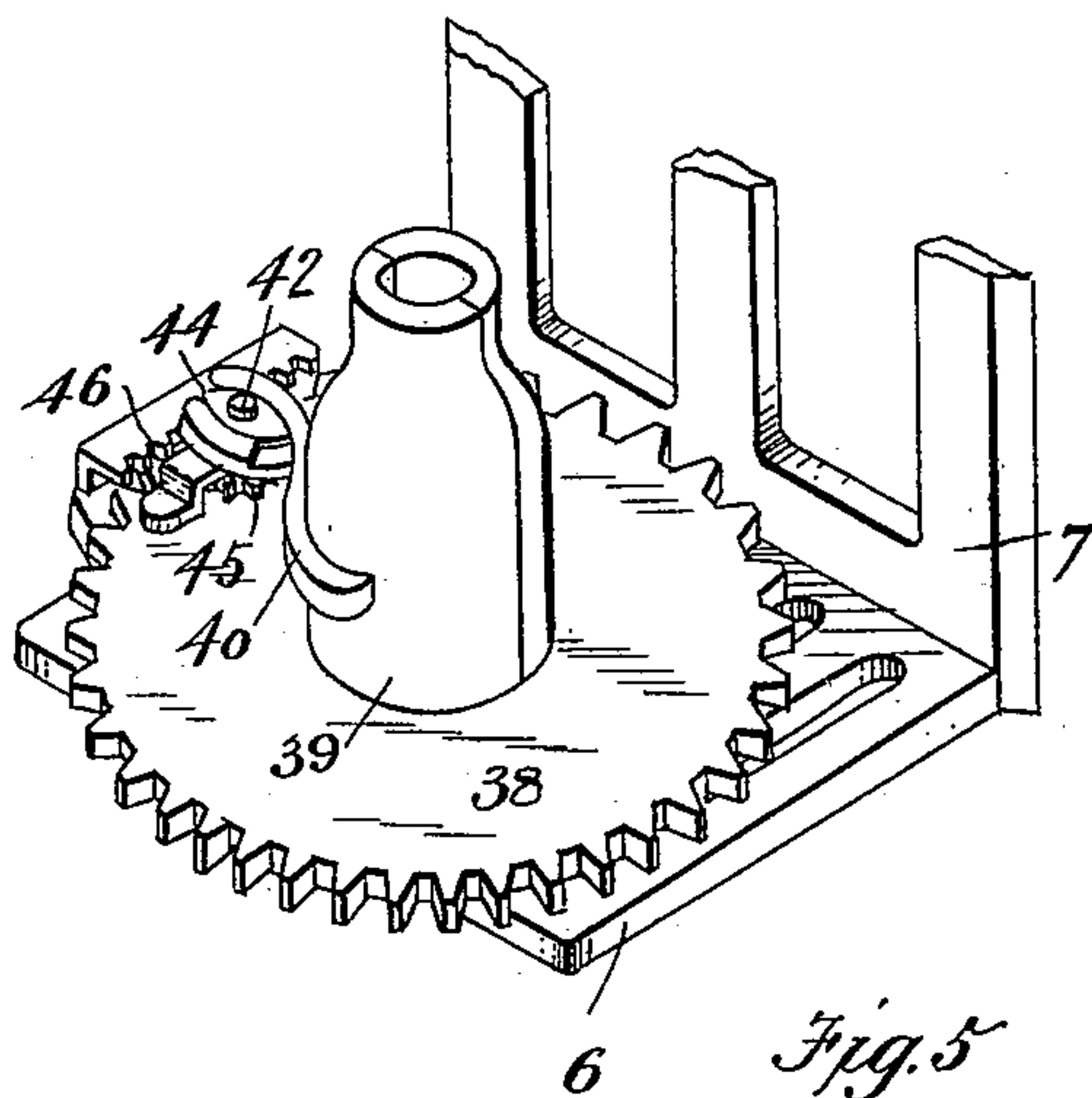
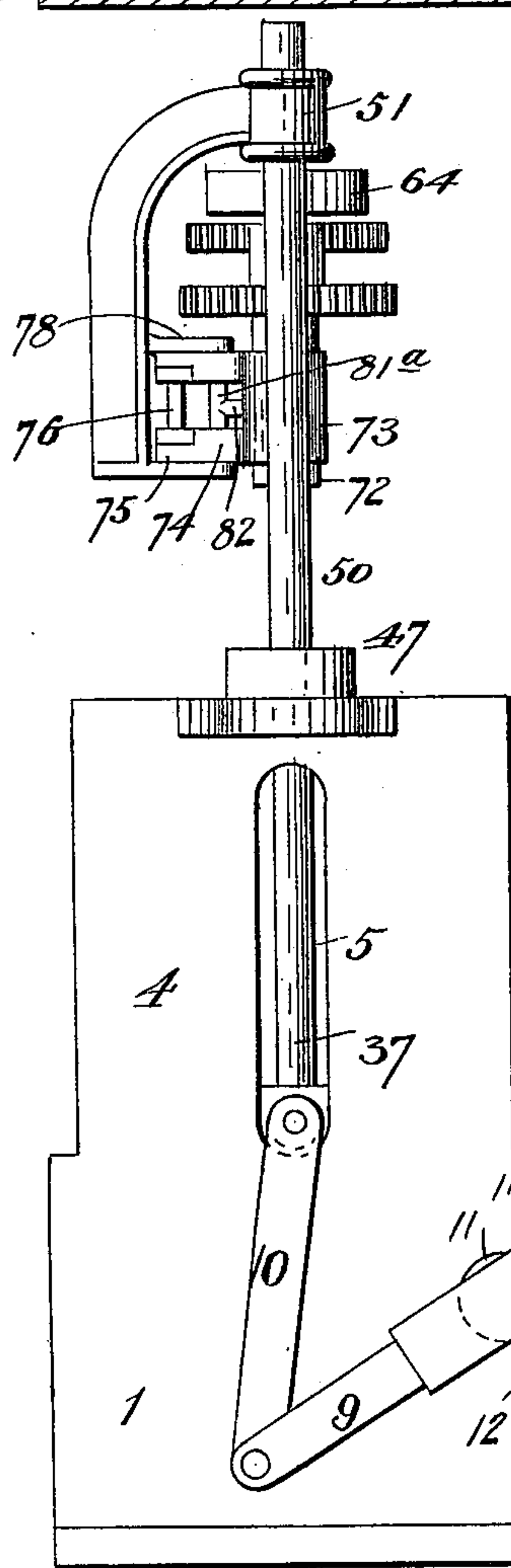


Fig. 5

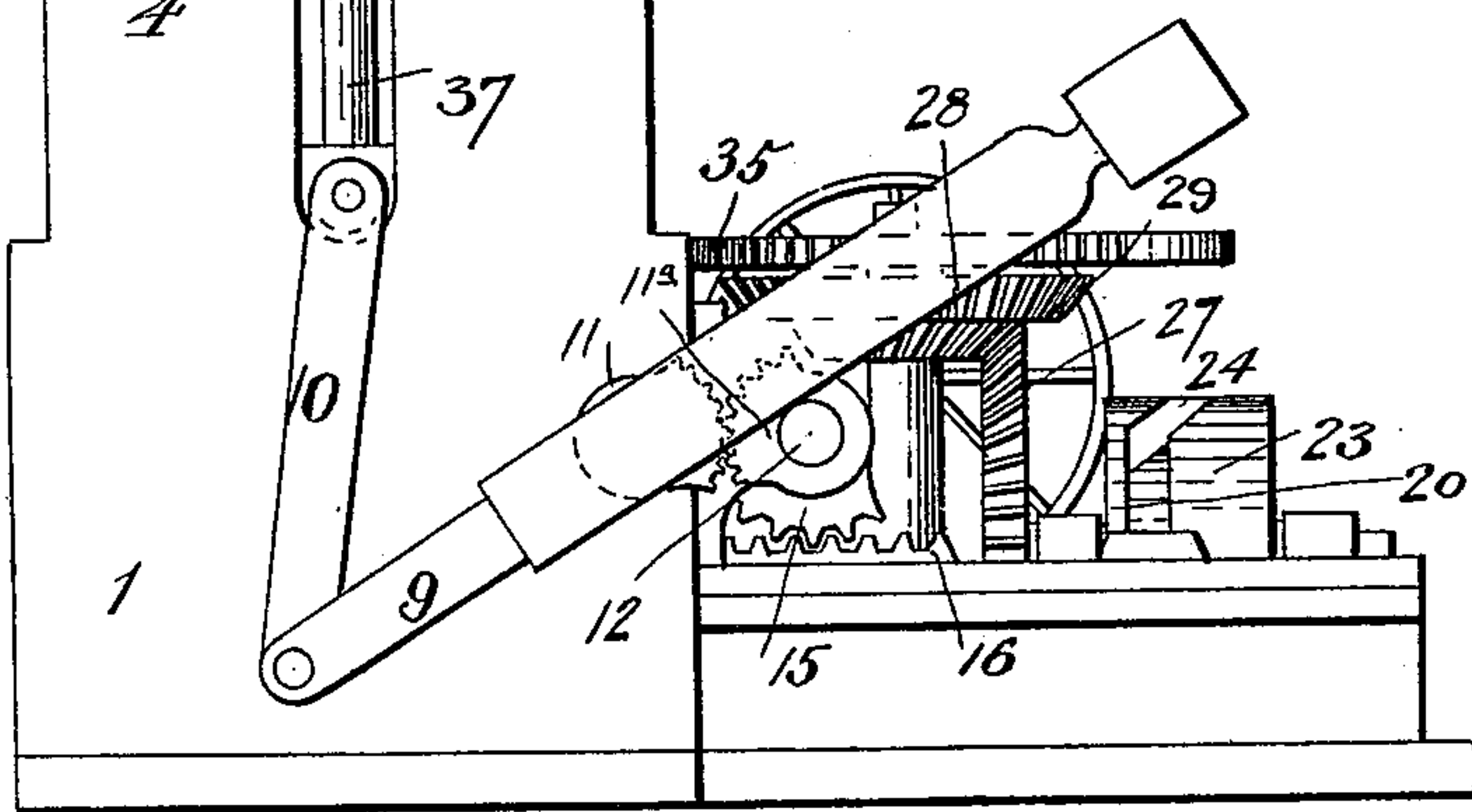


Fig. 6

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UNITED STATES PATENT OFFICE.

JOHN C. TRIANCE, OF ROCHESTER, PENNSYLVANIA.

PASTE-MOLD GLASS-BLOWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 636,590, dated November 7, 1899.

Application filed February 16, 1899. Serial No. 705,606. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. TRIANCE, a citizen of the United States, residing at Rochester, in the county of Beaver and State of Pennsylvania, have invented new and useful Improvements in Paste-Mold Glass-Blowing Machines, of which the following is a specification.

My invention relates to paste-mold glass-blowing machines of that class or description for which Letters Patent were granted to me September 20, 1898, No. 611,157; and its object is to provide improved means for alternately raising and lowering the molds and for opening the same to remove the completed article; also, to provide improved means for opening and closing the valves which control the air-blast to the blowpipe.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional view on the line *x x*, Fig. 2, of a glass-blowing machine constructed in accordance with my invention. Fig. 2 is a horizontal section on the line *y y*, Fig. 1, the mutilated gear which drives the vertical cam-operating shaft being removed. Fig. 3 is a detail cross-sectional view on the line *z z*, Fig. 2, the mutilated gear being in place. Fig. 4 is an end elevation. Fig. 5 is a detail perspective view of one of the molds and the means for opening the same. Fig. 6 is a bottom view of one of the cams for operating the air-blast valves. Fig. 7 is a detail plan view of the blowpipe-clamp.

In the said drawings the reference-numeral 1 designates a rectangular box provided with vertical partitions 2, forming two water tanks or receptacles 3. The ends of said box are formed with vertical extensions 4, provided with vertical slots 5. Located in said sections are alternately and vertically movable mold-carriers 6, secured to vertically-movable slides 7, provided with wrist-pins 8, projecting through said slots and connected with links 10. These links are pivotally connected with crank-arms 9, one of which arms is connected with an oscillating shaft 12, operated by means of a rack and mutilated pinion, hereinafter described. The arm 9 at the opposite side of the machine is secured to a mu-

tilated gear 11, which meshes with a corresponding gear on the end of the shaft 12. The construction is such that as said shaft 12 is oscillated by the mutilated pinion and rack-bar the said slides and mold will be alternately reciprocated. Secured to said shaft intermediate its ends is a mutilated pinion 15, which engages with a transversely-movable rack-bar 16, which works in ways in a track 17. Secured to said rack-bar is a pin 18, provided with a roller 19, engaging with peripheral cam-grooves 20 and 21 of a wheel 23. These grooves are connected by inclined passages 24, so that as said wheel is rotated the roller is alternately shifted from one groove to the other, so as to reciprocate the rack-bar and oscillate the shaft 12, whereby the mold-carriers are alternately raised and lowered. Said cam-wheel is secured to a transverse shaft 25, journaled in bearings 26, and at its inner end is provided with a beveled gear 27, which meshes with a corresponding pinion 28, formed with or secured to a bevel-gear 29, secured to a vertical shaft 30. This gear 29 meshes with a bevel-pinion 31 on the inner end of a horizontal shaft 32, provided with a pulley 34 at the outer end, by which it is rotated. Also secured to the shaft 30 is a horizontal mutilated gear 35, which meshes with a gear 36, secured to a vertical shaft 37. Pivoted to each of the mold-carriers is a horizontal gear-wheel 38, which alternately engages with the gear 36 as the said carriers are elevated.

The numeral 39 designates the molds, made in two parts hinged together by crossed hinges 40. These hinges are formed with curved extensions 41, which embrace an oval-shaped cam 44, carried by a rotatable shaft 42, provided with a pinion 45, which meshes with rack-bars 46, secured to the mold-carriers, when the gear-wheels 38 are rotated so as to open the mold.

Seated on the upper ends of the extensions 4 is a horizontal plate 47, having slots 48 in the front side and also with a central slot 49, through which latter the shaft 37 passes. This plate is provided with a hole near each end, through which pass uprights 50, connected together at the upper ends by a horizontal bar 51. Secured to said shaft 37 is a gear-wheel 52, which meshes with two pinions 53,

at opposite sides of said gear, fixed to sleeves 54, journaled on depending shafts 56, secured to the horizontal bar 51. These shafts are provided with flanges 57 at the lower ends, against which the lower ends of the sleeves abut and by which they are held in place. Secured to hubs 58 at the lower ends of the said sleeves are oppositely-disposed cams 59 for operating the blowpipe-clamps, as hereinafter described. Passing through said bar 51 and secured thereto are compressed-air pipes 60, connected with a suitable tank or reservoir (not shown) containing compressed air. These air-pipes are provided with horizontal cylindrical valve-casings 61. Located in these valve-casings are laterally-movable valves 62, the inner ends of which are reduced and surrounded by coiled springs 63, which bear against the closed ends of said casings and the shoulders formed by the reduced ends of the valves. The other ends of said valves project beyond the casings and are adapted to be struck and operated by cams 64, secured to pinions 66, journaled on the sleeves 54, and driven by a pinion 66^a, fixed to the shaft 37.

The compressed-air pipes 60, below the valve-casings, are formed with hubs 68, upon which are journaled the hubs 68^a of gears 69, meshing with gears 70, carried by the pinions 53. Said gears 69 are also formed with depending angular hubs 71, which engage with sectional clamps consisting of semicircular portions 72, which are connected with casings 73, provided with arms 74, provided with circular lugs 75, which are pivoted to a pin 76, secured to brackets 78. The inner sides of said clamps are provided with a lining 79, of rubber or other elastic material. The arms 74 are formed with oblong openings 80, with which engage S-shaped cams 81, secured to vertical shafts 81^a. Secured to these shafts are levers 82, with which the cams 59 alternately engage, whereby the clamps are opened to allow the blowpipe 82 to be inserted and removed.

The operation is as follows: In normal position one of the mold-carriers is elevated and the other depressed, the molds being open. A workman will now take a charge of glass from the furnace on the end of the blowpipe and will work it in the plate 47 above the box, so as to give it approximately the shape of the finished article. The bulb of the blowpipe is then placed in the mold and the latter closed. The machine is now set in motion and the mold rotated by the gears 36 and 38 and connections. When the mold has made a complete revolution, the pinion 45 will engage the rack-bar 46, rotating the cam 44 and forcing the extensions 41 apart and opening the mold, so that the completed article can be removed. While this is going on, the blowpipe will be rotated through the gear 69 and its angular hub engaging with the clamps 72, the parts being so timed that the blowpipe rotates at the same speed as the mold. The

cam 64 will now be out of engagement with the valve 62, so that the latter will be pressed outward by the coiled spring, so as to bring its reduced portion into coincidence with the vertical air-passage, and thus supply compressed air to the mold and causing the bulb therein to assume the contour or shape of the mold. By the time the mold is opened, as above described, the mutilated portion of gear 35 will come into coincidence with the gear 36, stopping the rotation of the mold, so that the completed article can be removed. At this time also the cam 59 will engage with lever 82, turning the shaft 81^a and cam 80 so that the clamps 72 will be opened to release the blowpipe. As said mutilated gear continues its movement the roller of the rack-bar 16 will be shifted to the other groove of the cam-wheel, laterally moving the rack-bar and through the pinion 15 turning the shaft 12, which through its connections will lower the elevated mold-carrier and mold into the water below. At the same time the other mold-carrier and mold will be elevated and the operation repeated with this mold.

By the above it will be seen that the molds are alternately elevated and opened to receive a charge and to remove the finished article and are rotated to insure the proper shape being given to the article by the air-pressure and the molds lowered into the water-receptacles to cool and cleanse the same. The air-supply is also established automatically while the molds are being rotated and is shut off when they are stopped.

The gears by which the machine is operated must be so proportioned and constructed that the different operations of elevating and lowering the molds and opening the same and opening and closing the air-valves shall take place at the proper times.

Having thus fully described my invention, what I claim is—

1. In a machine of the character described, the combination with the water-receptacles, the alternately and vertically reciprocating mold-carriers, the arms connected therewith and the cranks, of the oscillating shaft with which said cranks are connected, the pinion secured thereto, the reciprocating rack-bar, the pin and roller and the cam-wheel having connected peripheral cam-grooves, and means for rotating said cam-wheel, substantially as specified.

2. In a machine of the character described, the combination with the water-receptacles, the alternately and vertically reciprocating mold-carriers, the arms connected therewith, the cranks, the oscillating shaft with which said cranks are connected and the pinion carried by said shaft, of the reciprocating rack-bar, the pin and roller, the cam-wheel formed with connected peripheral cam-grooves, its shaft, the bevel-gear at the inner end thereof, the vertical shaft provided with a bevel-gear meshing therewith, the bevel-pinion on said vertical shaft and the horizontal shaft pro-

vided with a bevel-gear, substantially as specified.

3. In a machine of the character described, the combination with the water-receptacles, 5 the alternately and vertically reciprocating mold-carriers, of the sectional molds located on said mold-carriers, hinged together, the hinges provided with curved extensions, the shaft provided with an oval-shaped cam and 10 a pinion, the rack-bar carried by said mold-carriers, and means for intermittently rotating said wheels which carry the molds, substantially as described.

4. In a machine of the character described, 15 the combination with the water-receptacles, the alternately and vertically movable mold-carriers and means for reciprocating the same, of the gear seated on said mold-carriers, the sectional molds carried thereby, the crossed 20 hinges formed with curved extensions, the shaft provided with a cam and a pinion, the rack-bar connected with said mold-carriers, and the mutilated gear and means for rotating the same, substantially as specified.

25 5. In a machine of the character described, the combination with the alternately and vertically reciprocating molds, of the valve-

chambers adapted to be connected with a compressed air tank or reservoir, the valves located therein having reduced ends, the coiled 30 springs, the cams for operating said valves and the clamps for holding the blowpipe, substantially as described.

6. In a machine of the character described, the combination with the alternately and ver- 35 tically reciprocating molds, of the vertical shaft, the gears secured thereto, the shafts having sleeves provided with gears with which the gears on said vertical shaft engage, and with cams at the lower ends, the 40 compressed-air pipe, the valve-casing, the gear journaled thereon provided with an angular hub, the pivoted clamps, the arms thereof formed with slots, the cams engaging therewith and the levers, substantially as de- 45 scribed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN C. TRIANCE.

Witnesses:

T. M. HAAS,
C. L. SAYERS.