

No. 625,548.

Patented May 23, 1899.

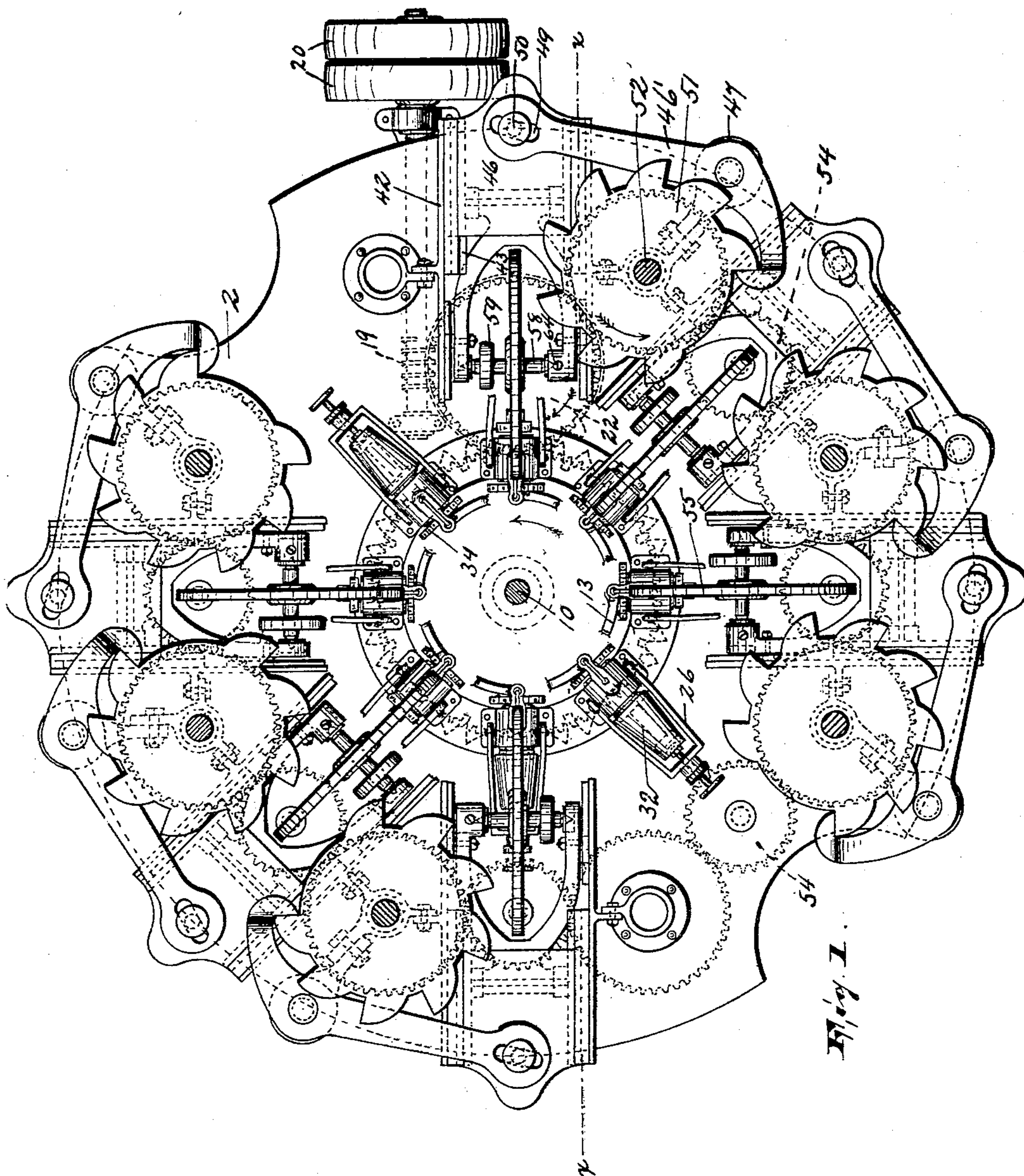
J. B. FONDU.

MANUFACTURE OF GLASS TUMBLERS.

(Application filed Dec. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Wm. D. Bell.
Robert J. Pollitt

INVENTOR

Jean Baptiste Fondu

BY

Arthur Stewart
ATTORNEYS

No. 625,548.

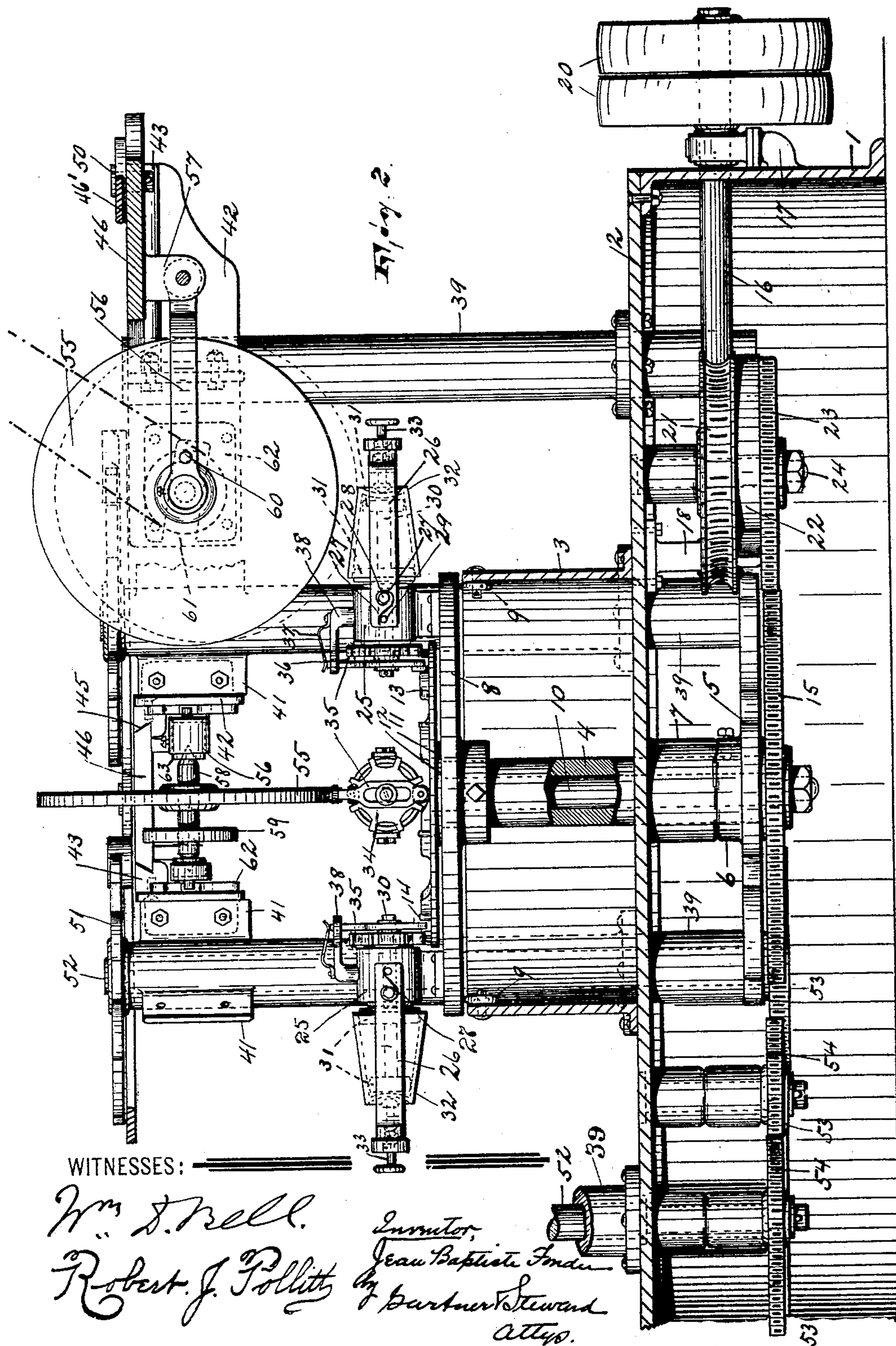
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

JEAN BAPTISTE FONDU, OF BRUSSELS, BELGIUM.

MANUFACTURE OF GLASS TUMBLERS.

SPECIFICATION forming part of Letters Patent No. 625,548, dated May 23, 1899.

Original application filed February 12, 1898, Serial No. 674,061. Divided and this application filed December 23, 1898.
Serial No. 700,120. (No model.)

To all whom it may concern:

Be it known that I, JEAN BAPTISTE FONDU, a subject of the King of Belgium, residing in Brussels, in the Kingdom of Belgium, have
5 invented certain new and useful Improvements in the Manufacture of Glass Tumblers, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled
10 in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

15 The invention herein referred to constitutes a division of the subject-matter of an application for Letters Patent filed by me in the United States Patent Office February 12, 1898, Serial No. 674,061.

20 The invention relates to the manufacture of glass tumblers, and it has reference particularly to a machine for forming faces and polishing the faces thus formed upon the blown tumblers.

25 The invention consists in the improved machine for forming faces and polishing the faces thus formed upon the blown tumblers and in the combination and arrangement of the various parts, substantially as will be hereinafter described and finally embodied in the
30 clauses of the claim.

The invention is fully illustrated in the accompanying drawings, wherein like numerals of reference indicate corresponding parts in
35 both figures, and in which—

Figure 1 is a top plan view of the machine constituting the subject of this invention; and Fig. 2 is a vertical sectional view taken on the line *xx* of Fig. 1, certain parts of the machine being removed and others broken away.

40 In said drawings, 1 indicates a substantially circular base, upon which is secured by bolts or other suitable means a top plate 2, and 3 designates a support or frame of circular shape, but of considerably less diameter than the base 1, said support or frame being centrally secured upon the top plate 2. Projecting upwardly through said frame or support
45 3 and penetrating the top plate is a sleeve 4, which has keyed to its lower end a notched and scalloped disk 5, whose upwardly-pro-

jecting hub 6 abuts against the downwardly-projecting boss 7, formed upon the top plate. To the upper end of the sleeve 4 is secured a disk 8, which rests upon small wheels 9, hav- 55
ing bearings near and projecting slightly above the upper edge of the frame or support 3. The sleeve 4, as well as the disk 8 and the notched and scalloped disk 5, is penetrated by a shaft 10, to which is secured at the up- 60
per end thereof a substantially circular plate 11, spaced from the disk 8 by an integral collar 12 and carrying upon its upper face a series of cams 13 and tappets 14. To the lower end of said shaft is secured a gear 15, which 65
is arranged just beneath the notched and scalloped disk 5.

It should be remarked that the sleeve 4 and the disk and the notched and scalloped disk which it carries and the shaft 10 and the cir- 70
cular plate 11 and the gear 15 which it carries are revoluble within their respective bearings.

16 designates a horizontal shaft having bearings in brackets 17 and 18, suitably disposed 75
and secured to the base and top plate, respectively. 19 designates a worm upon the inner end of said shaft, and 20 designates driving-pulleys for said shaft. The worm 19 is in engagement with the worm-wheel 21, 80
which is mounted with a single finger-cam 22 and a pinion 23 upon a stub-shaft 24, that is suspended from the top plate. The pinion 23 is in engagement with the gear 15, and the cam 22 intermittently engages the notched 85
and scalloped disk 5.

25 designates vertical supports of the tumbler-holders, said supports being mounted upon the disk 8 at uniform intervals and being preferably eight in number. Pivotal- 90
ly connected at its inner ends to each support is a yoke 26, which is normally held in a substantially horizontal position by means of a pair of springs 27 of approximately spiral shape, said springs being coiled about and se- 95
cured to the bearing-pin 28 of the yoke and having their respective free ends extending to and over other pins 29 projecting from the yoke. The yoke is penetrated by a spindle 30, which is journaled therein and which car- 100
ries elastic rings 31, one of which is situated at or near the end of said spindle. Upon the

cushioned mandrel which the spindle thus provided with the elastic rings constitutes is adapted to be received a tumbler 32, said tumbler being held in proper position with respect to the yoke by means of a spring-controlled plunger 33, having a cushion at its inner end adapted to bear against the bottom of the tumbler.

The spindle 30 carries rigidly secured there-
to near its inner end a tappet-wheel 34, so situated relatively to the tappets on the circular plate 11 as to have its teeth successively engaged by said tappets, so as to effect intermittent rotary movements of the spindle 30, and consequently the tumbler which it carries. In order that the spindle may not rotate except when actuated by the tappets and through its tappet-wheel, a vertically-movable holder 35, having a projection 36, which engages the notches between the teeth of the tappet-wheel, is provided. Said holder is normally held downwardly by a flat spring 37, which is secured upon a bracket 38, projecting from the support 35 and providing guiding means for the upper end of the holder which penetrates it. The holder has a vertical slot, through which the inner end of the spindle projects, and it furthermore has a roller at its free end, which bears upon the circular plate and the cams arranged thereon, so as to actuate said holder. The cams are so arranged relatively to the tappets that the tappet-wheel is released thereby for rotation just before it is engaged by a tappet and is re-engaged by said holder just after said tappet has effected its actuation.

It should be remarked that preferably three grades of abrading devices are provided for operating upon the tumblers to produce the faces thereon in completed shape, said abrading devices being disposed in graduated relation in the machine, so that the tumblers are successively subjected to them. It should also be remarked that the set of tumblers which is being operated upon is moved bodily, so as to bring the tumblers successively to the various grinding devices, which are arranged in the machine stationarily with reference to said tumblers. In view of these facts it will be seen that the arrangement of the gearing which drives the disk 8 and the circular plate 11 must be such that the latter will effect a complete individual rotation of each tumbler before the former effects the movement of the set of tumblers bodily, so as to bring the same to a new position.

The abrading devices may be described as follows: Upon standards 39, which are mounted upon and secured to the top plate 2, are arranged near the tops thereof lugs or projections 41, varying in number from one to three, as necessity requires. Between the standards 39 are pairs of guide-plates 42 and having upon their adjoining faces guides 43, each plate being supported upon a standard by means of a bolt 44, which projects through a lug upon the outer face of said guide-plate

and a lug on the standard. The guides 43 have in their adjoining faces dovetailed grooves 45 for the reception of the correspondingly-shaped edges of a plate 46, adapted to reciprocate on said guides horizontally when actuated by a hooked lever or pawl 46', that is fulcrumed upon an arm 47, secured to one of the lugs 41 of the standards, said lever having a slot 49 at its inner end, which receives a pin 50 upon the upper face of the plate 46. The lever is adapted to be actuated so as to throw its hooked end outwardly by means of a toothed cam 51, journaled above the standard 39 and being operated by a shaft 52, to which it is secured at the upper end thereof, said shaft carrying at its lower end a pinion 53, that is one of a train of similar pinions having similar functions, motion being imparted to said train of pinions from the first one which engages the pinion 23 through intermediate smaller pinions 54. It should be remarked that each toothed cam 51 is provided with eight teeth, the members of correspondingly-disposed pairs of which are separated by a space, as shown in Fig. 1.

55 designates one of the abrading-disks, said abrading-disks being journaled in the free ends of a bifurcated lever 56, which is fulcrumed at its shank end in a pair of projections 57, extending downwardly from the plate 46. The bearing-spindle 58 of the abrading-disk carries a belt wheel or pulley 59, over which passes, as shown in Fig. 2, a belt from a suitable driving apparatus that is arranged above the machine, said belt extending in a direction which is oblique to the perpendicular. It will be seen that while being rotated about its spindle as an axis and while the machine is in normal operation the abrading-disk will be given a reciprocating motion, which is imparted to it from the toothed cam 51 through the lever 46' and the plate in which the bifurcated lever, which carries said abrading-disk, is fulcrumed. By virtue of the motion thus imparted to the abrading-disk the latter is made to act upon the side of the tumbler from top to bottom thereof. In order that the action of the disk upon the tumbler may be uniform at all points upon the latter, pins 60 are secured near the free ends of the bifurcated lever 56, projecting outwardly therefrom and being guided in slots 61, that are formed in plates 62, which plates are secured to opposing faces of the pairs of guide-plates. It should be stated in order that the abrading-disk may be readily removed from and adjusted in its bearings blocks 63 are provided in the free ends of said bifurcated lever, said blocks receiving the ends of the spindle 58 and being adjustably mounted in the lever by means of set-screws 64.

The operation of the machine which has been above described is as follows: It being assumed that the gearing is properly arranged and that the various members thereof are of proper dimensions, the motion which is imparted from the drive-shaft 16 to the worm-

wheel 21 and from thence to the cam 22 and the pinion 23 will effect intermittently the rotation of the notched and scalloped disk and continuously of the gear 15, the result
 5 being a consequent intermittent rotation of the disk 8 and the circular cam and tappet-carrying plate 11. As hereinbefore set forth, the movements of the disk 8 and the circular
 10 of each tumbler and also an intermittent rotation about the shaft 10 of the set of tumblers. During each of the rotations of the tumblers individually in their holders the particular abrading-disk which is acting upon
 15 said tumbler is being intermittently reciprocated, so as to act upon each face of said tumbler as it is presented to it. When the rotation of each tumbler has been completed and when, also, the rotation of the toothed cam
 20 51 has actuated the hooked lever 46 a number of times which corresponds to the number of faces (or intermittent motions) of the tumbler, said tumbler will then be carried upon the disk 8 to the next position, and dur-
 25 ing this interval the lever 46 will remain inactive, this result being produced by so disposing the space that is provided between two of the teeth of the toothed cam that it will be reached by the hooked portion of the
 30 lever at a time which coincides with that when the set of tumblers is being moved to the new position.

The belt which drives each abrading-disk is arranged at an incline to the perpendicular, so that it may act upon said disk to re-
 35 turn the same to the position from which it has been moved by the action of the lever 46.

It should be remarked that any suitable and well-known means may be provided for
 40 so acting upon the driving-belt of each abrading-disk as to automatically effect a raising of said disk during the intermittent motions of the tumblers upon which it is acting.

I have found it preferable to use three
 45 abrading-disks to produce a tumbler having the properly formed and finished faces upon its sides, the first one of said abrading-disks to which the tumblers are each subjected being composed of cast-iron, with which sand
 50 and water are used, the second one being composed of sandstone, and third one being composed of felt, cork, or similar material. The machine may be built with these abrading-
 55 disks arranged in two sets, the mechanisms for acting intermittently upon the individual tumblers, as well as the mechanisms for rotating the sets of tumblers into operative con-
 60 tiguity to the successive abrading devices, being correspondingly arranged. For these reasons the arrangement which is shown in Fig. 1 is provided, wherein appear six complete mechanisms arranged in two sets and wherein a space is left at each side of the machine be-
 65 tween said sets, said spaces being left so that the tumblers may be mounted and dismounted from their holders without inconvenience.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for grinding and polishing 70
 faces upon the sides of a plurality of glass tumblers or other similar vessels synchronously, the combination, with a frame and with an abrading device and tumbler-carrying means
 75 operatively arranged on said frame, of means for intermittently rotating the tumblers indi-
 vidualy upon their respective axes, substantially as described.

2. In a machine for grinding and polishing 80
 faces upon the sides of a plurality of glass tumblers or other similar vessels synchronously, the combination, with a frame and with an abrading device and tumbler-carrying means
 85 operatively arranged on said frame, of a revoluble tumbler-carrying mandrel constitut-
 ing a portion of said tumbler-carrying means, a tappet-wheel mounted on said mandrel, a
 tappet-carrying plate revolubly mounted in operative contiguity to said tappet-wheel and
 90 means for rotating said plate, substantially
 as described.

3. In a machine for grinding and polishing
 faces upon the sides of a plurality of glass tumblers or other similar vessels synchronously, the combination, with a frame and with an 95
 abrading device, of a disk mounted on said frame, supports concentrically mounted on
 said disks, mandrels journaled in said supports, tappet-wheels carried by said mandrels,
 a revoluble tappet-carrying plate arranged in 100
 operative contiguity to said tappet-wheels and means for rotating said plate, substantially
 as described.

4. In a machine for grinding and polishing 105
 faces upon the sides of glass tumblers or similar vessels, the combination, with a frame and with an abrading device, of a disk mounted
 on said frame, supports concentrically mounted on said disk, mandrels journaled in said
 110 supports, tappet-wheels carried by said mandrels, spring-actuated holders for said tappet-
 wheels, a revoluble cam and tappet-carrying plate arranged in operative contiguity to said
 holders and tappet-wheels, and means for ro- 115
 tating said plate, substantially as described.

5. In a machine for grinding and polishing
 faces upon the sides of glass tumblers or other similar vessels, the combination, with a frame
 and with an abrading device, of a disk mount- 120
 ed on said frame, supports concentrically
 mounted on said disk, mandrels journaled in
 said supports, yokes pivotally connected to
 said supports, spring-actuated plungers
 mounted in the free ends of said yokes, tap- 125
 pet-wheels carried by said mandrels, spring-
 actuated holders for said tappet-wheels, a
 revoluble cam and tappet-carrying plate ar-
 ranged in operative contiguity to said holders
 and tappet-wheels, and means for rotating
 said plate, substantially as described. 130

6. In a machine for grinding and polishing
 faces on the sides of glass tumblers or other
 similar vessels, the combination, with a frame
 and with an abrading device, of a revoluble

disk mounted on said frame, supports concentrically mounted on said disk, mandrels journaled in said supports, tappet-wheels carried by said mandrels, spring-actuated holders for said tappet-wheels, a revoluble cam and tappet-carrying plate arranged in operative contiguity to said holders and tappet-wheels and concentrically with respect to said disk, a notched and scalloped disk rigidly connected to said first-named disk, a gear rigidly connected to said cam and tappet-carrying plate, a cam and pinion operatively engaging said notched and scalloped disk and said gear, respectively, and means for rotating said cam and pinion, substantially as described.

7. In a machine for grinding and polishing faces upon the sides of glass tumblers or other similar vessels, the combination, with a frame, of revoluble abrading-disks, means for rotating said abrading-disks and for intermittently withdrawing the same, a revoluble disk mounted on said frame, supports concentrically arranged on said disk, mandrels journaled in said supports, tappet-wheels carried by said mandrels, spring-actuated holders for said tappet-wheels, a revoluble cam and tappet-carrying plate arranged in operative contiguity to said holders and tappet-wheels and concentrically with respect to said disk, a notched and scalloped disk rigidly connected to said first-named disk, a gear rigidly connected to said cam and tappet-carrying plate, a cam and pinion operatively engaging said notched and scalloped disk and said gear, respectively, and means for rotating said cam and pinion, substantially as described.

tively engaging said notched and scalloped disk and said gear, respectively, and means for rotating said cam and pinion, substantially as described.

8. In a machine for grinding and polishing faces upon the sides of glass tumblers or other similar vessels, the combination, with a frame, of revoluble abrading-disks, means for rotating said abrading-disks and for intermittently withdrawing the same, means for reciprocating said abrading-disks, a revoluble disk mounted on said frame, supports concentrically mounted on said disk, mandrels journaled in said supports, tappet-wheels carried by said mandrels, spring-actuated holders for said tappet-wheels, a revoluble cam and tappet-carrying plate arranged in operative contiguity to said holders and tappet-wheels and concentrically with respect to said disk, a notched and scalloped disk rigidly connected to said first-named disk, a gear rigidly connected to said cam and tappet-carrying plate, a cam and pinion operatively engaging said notched and scalloped disk and said gear, respectively, and means for rotating said cam and pinion, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of December, 1898.

JEAN BAPTISTE FONDU.

Witnesses:

J. P. H. POHLE,
GREGORY PHELAN.