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Patented Apr. 4, 1899.

J. B. FONDU.

MANUFACTURE OF GLASS TUMBLERS.

(Application filed Dec. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.

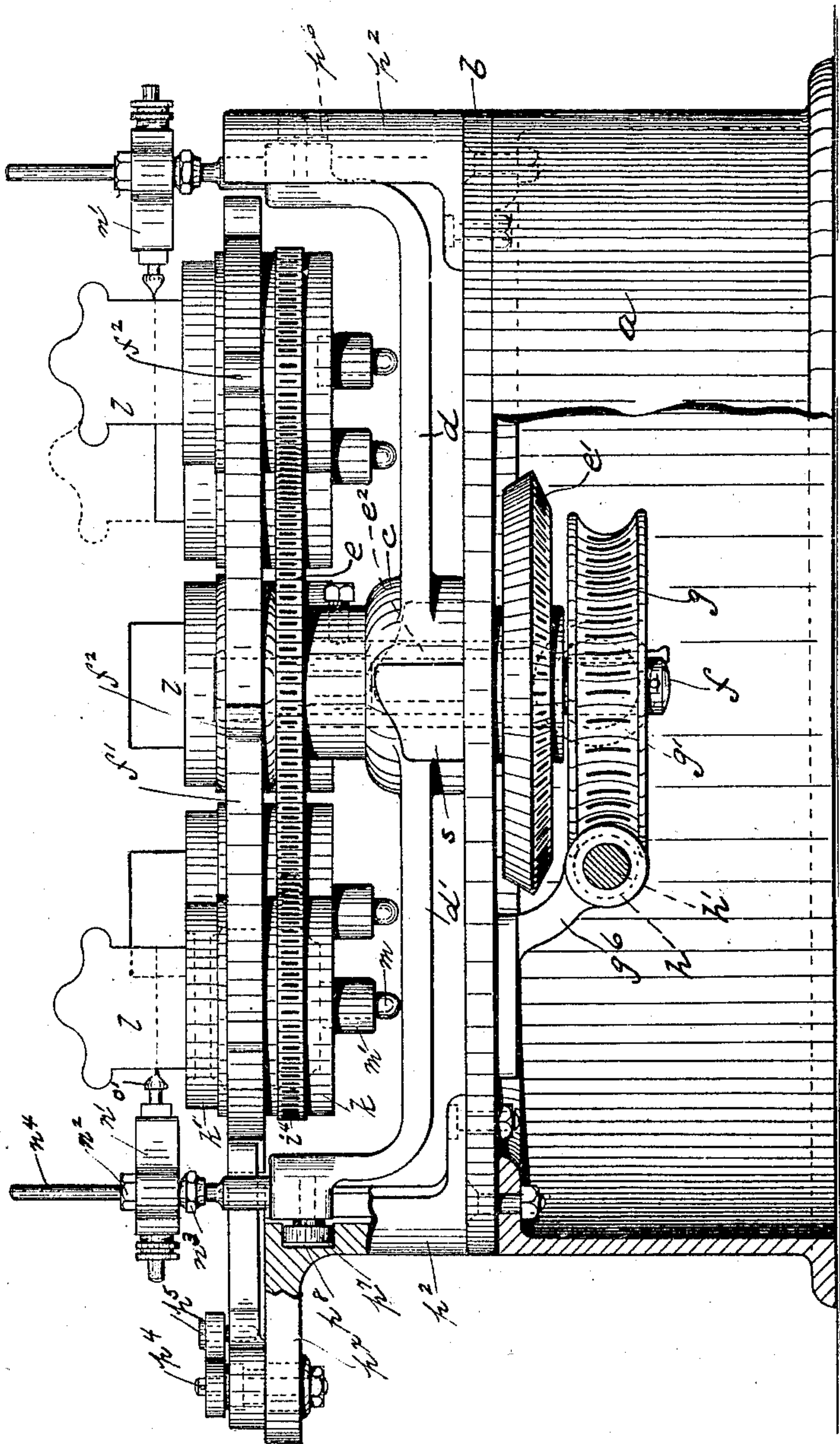


Fig. 1.

WITNESSES:

INVENTOR:

*Wm. D. Bell*  
*Robert F. Pollitt*

*Jean Baptiste Fondu*

BY

*Gartner & Steward*  
ATTORNEYS

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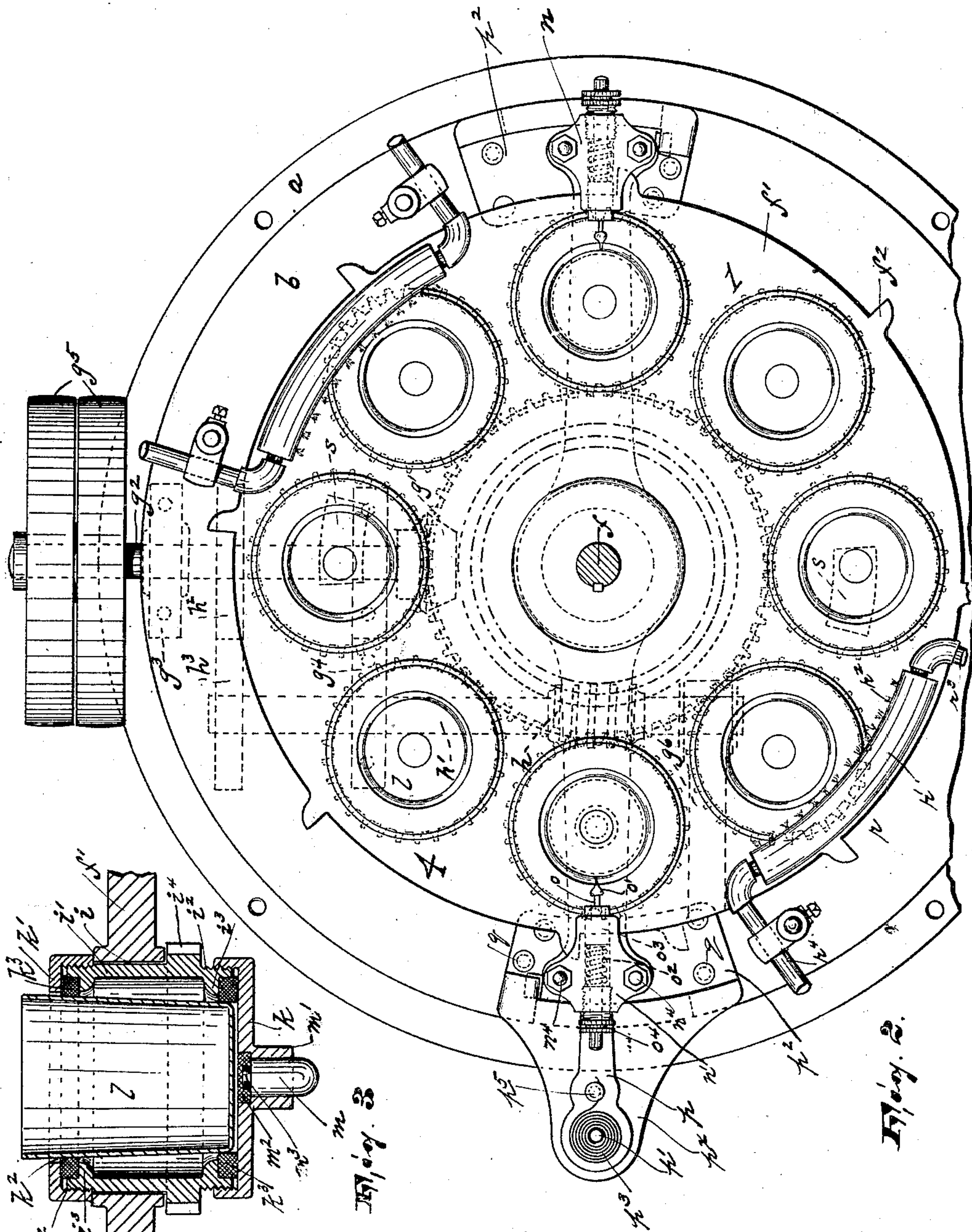
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*Wm. D. Bell.*  
*Robert F. Pollitt.*

INVENTOR:

*Jean Baptiste Fondu*

BY  
*Partnes & Steward*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

JEAN BAPTISTE FONDU, OF BRUSSELS, BELGIUM.

## MANUFACTURE OF GLASS TUMBLERS.

SPECIFICATION forming part of Letters Patent No. 622,458, dated April 4, 1899.

Original application filed February 12, 1898, Serial No. 670,061. Divided and this application filed December 23, 1898; Serial No. 700,119. (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 invented certain new and useful Improvements in the Manufacture of Glass Tumblers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and numerals of reference marked thereon, which form a part of this specification.

The invention herein referred to constitutes a division of the subject-matter referred to in an application for Letters Patent filed by me in the United States Patent Office February 12, 1898, Serial No. 670,061.

The invention herein referred to relates to the manufacture of glass tumblers; and it has reference particularly to a machine for evenly or uniformly cutting or trimming off the tops of the blown tumblers.

The invention consists in the improved machine for cutting or trimming off the tops of the blown tumblers and in the combination and arrangement of the various parts of said machine, substantially as will be hereinafter pointed out, and finally embodied in the clauses of the claim.

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

Figure 1 is a view, partly in side elevation and partly in section, of the machine. Fig. 2 is a top plan view of said machine, and Fig. 3 is a sectional view of one of the tumbler holders or sockets employed in the said machine.

In said drawings, *a* designates a base or frame upon which is mounted (being secured thereto by screws or bolts) a plate *b*. Resting centrally upon the top of said plate is arranged a collar *c*, provided with laterally-projecting arms *d d'*, integrally formed therewith and bent upwardly at their free ends. Upon the top of said collar is revolubly mounted a gear-wheel *e*, which is rigidly connected with

a bevel-gear *e'* through an intermediate sleeve *e''*, which penetrates the plate *b* and the collar *c*.

Penetrating the sleeve *e''* is a revoluble shaft *f*, upon the upper end of which and resting upon the gear-wheel *e* is keyed a circular plate or disk *f'*, having several peripheral teeth *f''*, and upon the lower end of which shaft is keyed a worm-wheel *g*.

Motion is imparted to the bevel-gear *e'* from a bevel-pinion *g'* on one end of a drive-shaft *g''*, revolubly mounted in brackets *g'''* and *g''''* and adapted to receive its rotary movement from one of a pair of pulleys *g'''''*, and motion is imparted to the worm-wheel *g* from a worm *h*, mounted on a shaft *h'*, journaled in said brackets *g'''* and *g''''* and also in a bracket *g''''''*, extending downwardly from the frame or base *a*, said shaft being adapted to take its movement from the drive-shaft *g''* through intermeshing pinions *h''* *h'''*, carried on said shaft. From the foregoing description of the gearing it will be seen that the gear-wheel is rotatable at a higher degree of speed than the circular plate or disk *f'*.

The circular disk or plate *f'* is provided with a series of equidistantly-disposed orifices or openings *i*, wherein are adapted to be revolubly mounted the holders or sockets for the reception of the tumblers to be operated upon. Each of said sockets consists of a cylindrical barrel or chamber *i'*, having an external threading *i''* and an internal flange *i'''* at its lower as well as at its upper edge, and also having a series of gear-teeth *i''''*, integrally formed upon and surrounding it. *k* indicates the bottom or base of the socket or holder, and *k'* indicates the cap therefor, said base and the cap being provided with internal threading which engages the threading *i''* of the barrel or chamber. The cap *k'* is provided with an opening *k''* for the reception of the tumbler *l*, and between said cap and the upper flange and also between the lower flange and the base *k* is arranged an annular elastic cushion *k'''*. For a purpose hereinafter to be set forth the socket or holder is provided with a vertically-movable pin *m*, which is set in a nipple *m'*, integrally formed upon the base *k*, and which pin is rounded off at its lower end and carries at its upper end a cushion or pad *m''*, suitably



connected thereto, as by a threaded projection  $m^3$  on said pin. The cap and the surrounding teeth of each socket form an annular recess, into which projects the surrounding edge of the disk  $f'$ . The gear-teeth of all of said sockets are in mesh with the teeth of the gear-wheel  $e$ . Hence it will be seen that while the plate or disk  $f'$  is revolved, carrying with it the tumbler holders or sockets, each of said tumbler holders or sockets is also given a rotary movement of its own.

Upon the upwardly-projecting ends of the arms  $d$   $d'$  are arranged one on each arm tracing devices  $n$ . Each of said tracing devices consists of a block  $n'$ , adjustably mounted by means of nuts  $n^2$   $n^3$  upon a pair of posts  $n^4$  and having an opening therethrough extending radially with relation to the disk, in which opening is reciprocally mounted a pin  $o$ , carrying upon its free end a diamond  $o'$  and normally pressed inwardly by a spiral spring  $o^2$ , arranged in said opening and disposed between an enlargement  $o^3$  on said pin and an adjusting-nut  $o^4$ , situated in the outer end of said opening.

In order to obviate the danger of breakage owing to the sudden impact of the diamond with the approaching and rapidly-rotating tumblers, I have provided means for moving the diamond slowly to one side as a tumbler approaches it, so that the force of the blow will be minimized. This is effected by means of a lever  $p$ , fulcrumed at  $p'$  upon a projection  $p^x$  of one of a pair of diametrically opposite standards  $p^2$ , bolted to and extending upwardly from the base, said lever being under the control of a spiral spring  $p^3$ , coiled about the pivotal point, which may be a bolt or pin  $p^4$ , and secured at its free end to a pin  $p^5$  on said lever. The free end of said lever  $p$  projects between the posts  $n^4$  on the arm and is adapted to be engaged by each of the teeth  $f^2$  on the periphery of the disk  $f'$ , so as to impinge against one of said posts  $n^4$ , and thereby move the arms in the direction of the rotation of the disk. When the lever snaps back under actuation of its spring and after the tooth of the disk has become disengaged therefrom, said lever is adapted to strike against the other of the posts  $n^4$ , so as to return the arms  $d$   $d'$  to their original position. Rubber buffers  $q$  may be employed to take the impact of the arms in either of their movements. The ends of the arms  $d$   $d'$  are guided horizontally by rollers  $p^6$  and  $p^7$ , respectively, carried by said arms, operating in elongated recesses  $p^8$  in the standards  $p^2$ .

$r$  indicates a device adapted to heat the traced portions of the tumblers as fast as they approach from the tracing device, the consequent expansion making it therefore possible to easily remove the superfluous portion of said tumbler with a smart blow. Said heating apparatus may constitute an ordinary Bunsen-burner device and may consist, essentially, of a vertically-adjustable tube  $r'$ , having flame openings or perforations  $r^2$  and suit-

ably-controlled gas and air pipes  $r^3$   $r^4$ , communicating with said tube. Said tube is curved to conform to the direction of movement of the tumblers about the vertical shaft  $f$ .

$s$  indicates a pair of diametrically opposite cams mounted upon the disk or plate  $f'$  and adapted to be engaged by the cushioned pins  $m$  of the sockets.

In operation the newly-blown tumblers are pressed into the sockets at points which I have designated in Fig. 2 by the numerals 1 and 4, and the machine being in motion said tumblers are carried around to the tracing devices, where the diamonds act upon them as they rapidly rotate and move past the same, so as to cut off enough to produce a tumbler of the desired height. As each tracing device is approached by its respective tumbler it is acted upon, as and for the purpose heretofore described, by the spring-actuated lever  $p$ . Having passed the tracing device said tumblers approach the burners, where their traced portions are heated, so that the attendant can easily remove the tops with a slight smart blow, and where their consequently more or less rough edges are somewhat rounded off by being subjected to the heat thereof. When they have passed the heating apparatus, the tumblers are loosened in their sockets by the cushioned pins  $m$ , which wipe upon the cams  $s$ , whereupon said tumblers may be easily removed from the sockets by the operator.

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

1. In a machine for cutting glass tumblers, the combination with a frame and a tracing device or devices mounted thereon, of a revoluble tumbler-support mounted in said frame in operative contiguity to said tracing device or devices, means for revolving said tumbler-support and means for independently rotating the individual tumblers, substantially as described.

2. In a machine for successively cutting glass tumblers, the combination with a frame, and a tracing device or devices mounted thereon, of a revoluble tumbler-support, mounted in said frame in operative contiguity to said tracing device or devices, tumbler-sockets rotatably mounted in said support, means for revolving said tumbler-support and for independently rotating the individual tumbler-sockets, substantially as described.

3. In a machine for successively cutting glass tumblers, the combination with a frame and a tracing device or devices mounted thereon, of a revoluble tumbler-support mounted in said frame in operative contiguity to said tracing device or devices, toothed tumbler-sockets rotatably mounted in said support, a gear mounted in said frame and engaging said toothed sockets, and means for revolving said tumbler-support and the gear, substantially as described.



4. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate, and a tracing device or devices mounted thereon, of a collar mounted on said top plate, a gear mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support and also situated beneath said top plate, means for rotating said bevel-gear and the worm-wheel, and toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, substantially as described.

5. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate and with tracing devices, of a revoluble collar mounted on said top plate and having laterally-extending arms carrying said tracing devices at their extremities, a gear mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support, and also situated beneath said top plate, means for rotating said bevel-gear and the worm-wheel, and toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, substantially as described.

6. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate, of a revoluble collar mounted on said top plate and having laterally-extending arms, tracing devices adjustably mounted on the ends of said arms, a gear mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support, and also situated beneath said top plate, means for rotating said bevel-gear and the worm-wheel, and toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, substantially as described.

7. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate, of a revoluble collar mounted on said top plate and having laterally-extending arms, tracing devices adjustably mounted on the ends of said arms, a gear

mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support, and also situated beneath said top plate, toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, and means for revolving said collar and the tracing devices connected therewith, substantially as described.

8. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate, of a revoluble collar mounted on said top plate and having laterally-extending arms, tracing devices adjustably mounted on the ends of said arms, a gear mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support, and also situated beneath said top plate, toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, and means actuated by said tumbler-support for revolving said collar and the tracing devices connected therewith, substantially as described.

9. In a machine for successively cutting glass tumblers, the combination with a frame having a top plate, of a revoluble collar mounted on said top plate and having laterally-extending arms, tracing devices adjustably mounted on the ends of said arms, a gear mounted on said collar, a bevel-gear rigidly connected to said gear through the collar and arranged beneath said top plate, a revoluble tumbler-support mounted on said gear, a worm-wheel rigidly connected also through said collar to said tumbler-support, and also situated beneath said top plate, toothed tumbler-sockets engaging said gear and rotatably mounted in said tumbler-support, said tracing device or devices being situated in operative contiguity to said tumbler-sockets, means actuated by said tumbler-support for revolving said collar and the tracing devices connected therewith, and tumbler-dislodging mechanism, 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. NOBLEY,  
GREGORY PHELAN.