

No. 667,579.

Patented Feb. 5, 1901.

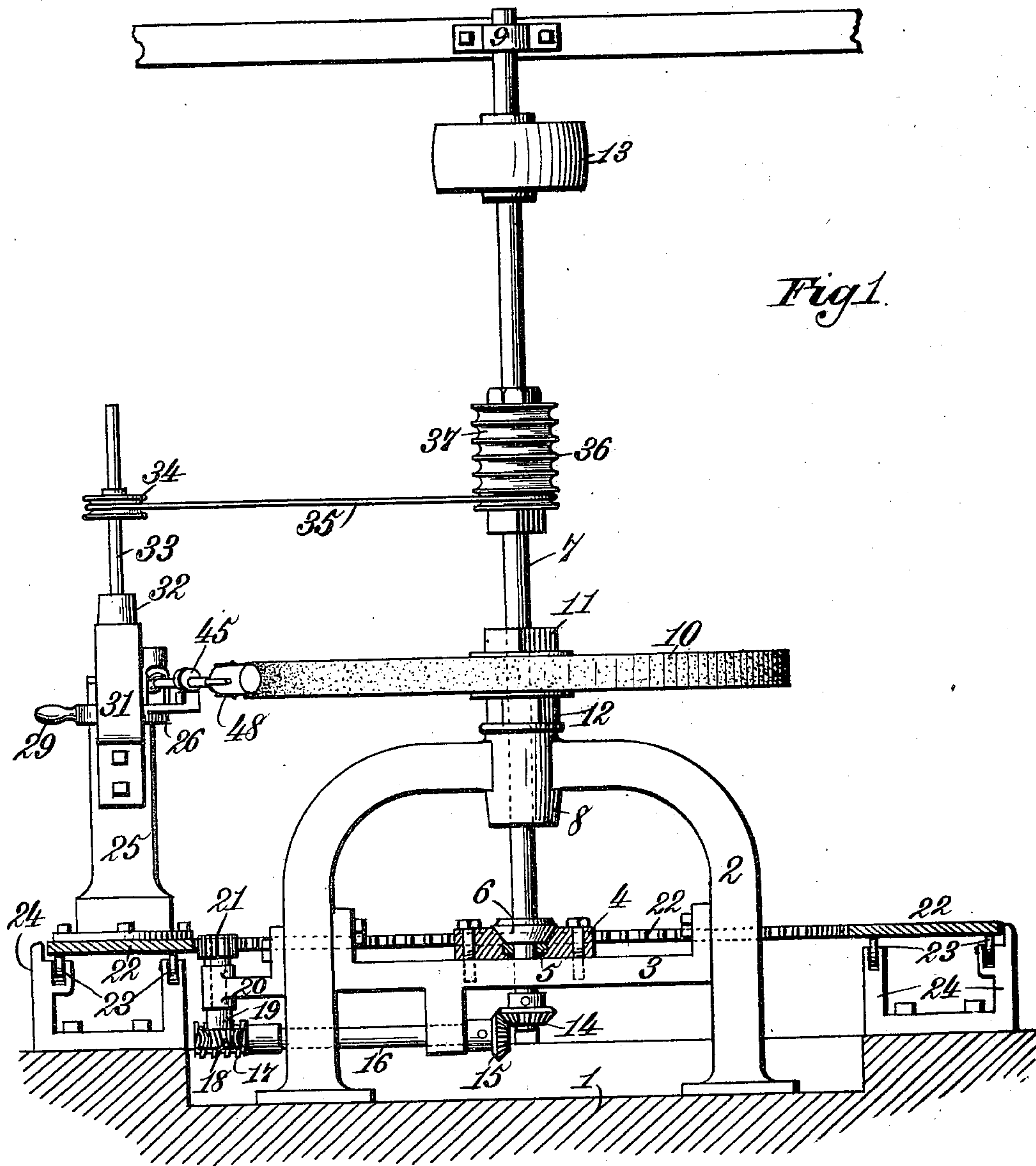
A. ROEMISCH.

APPARATUS FOR GRINDING AND SMOOTHING GLASS.

(Application filed Sept. 10, 1900.)

3 Sheets—Sheet 1.

(No Model.)



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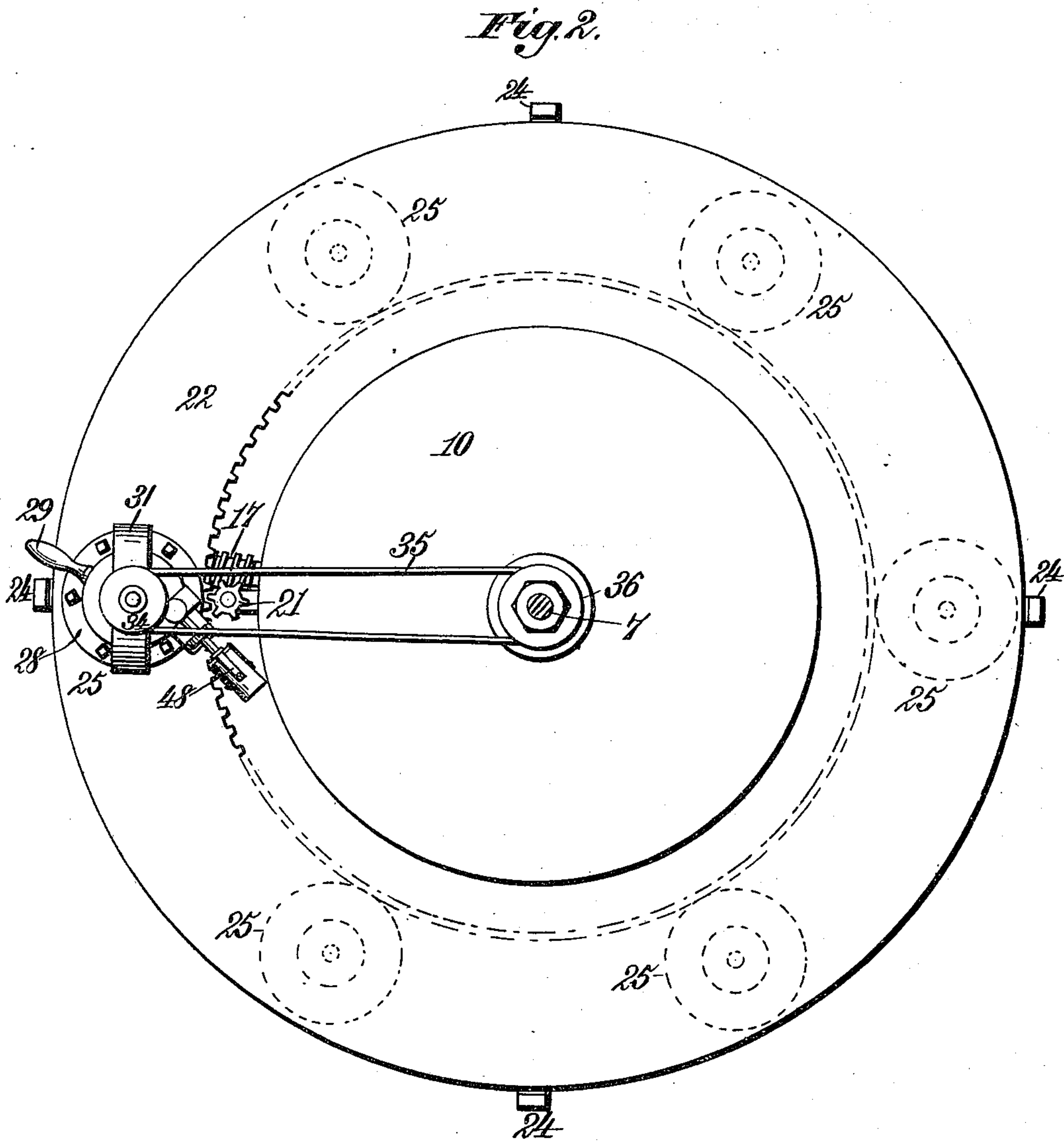
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3 Sheets—Sheet 2.



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Fig. 3.

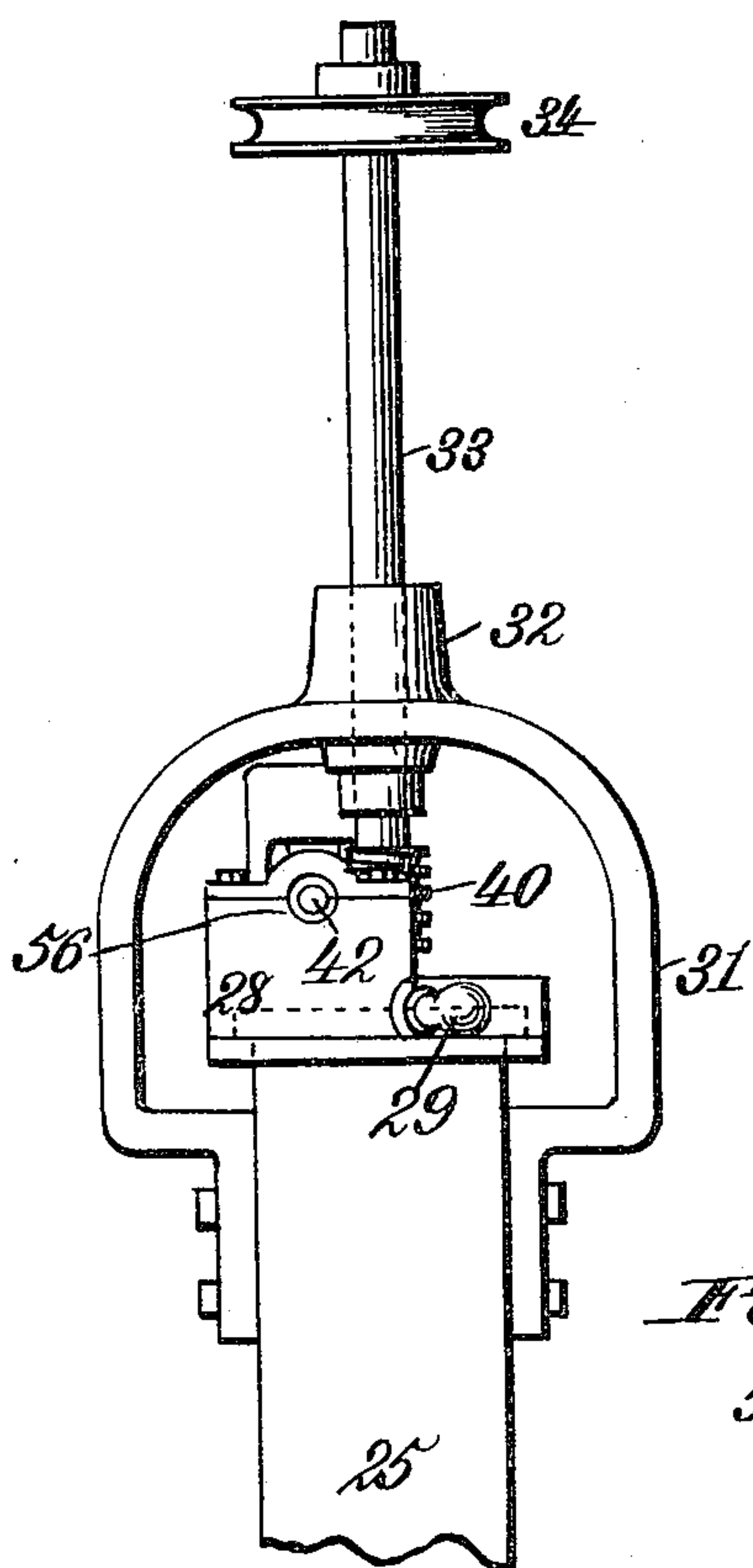


Fig. 4.

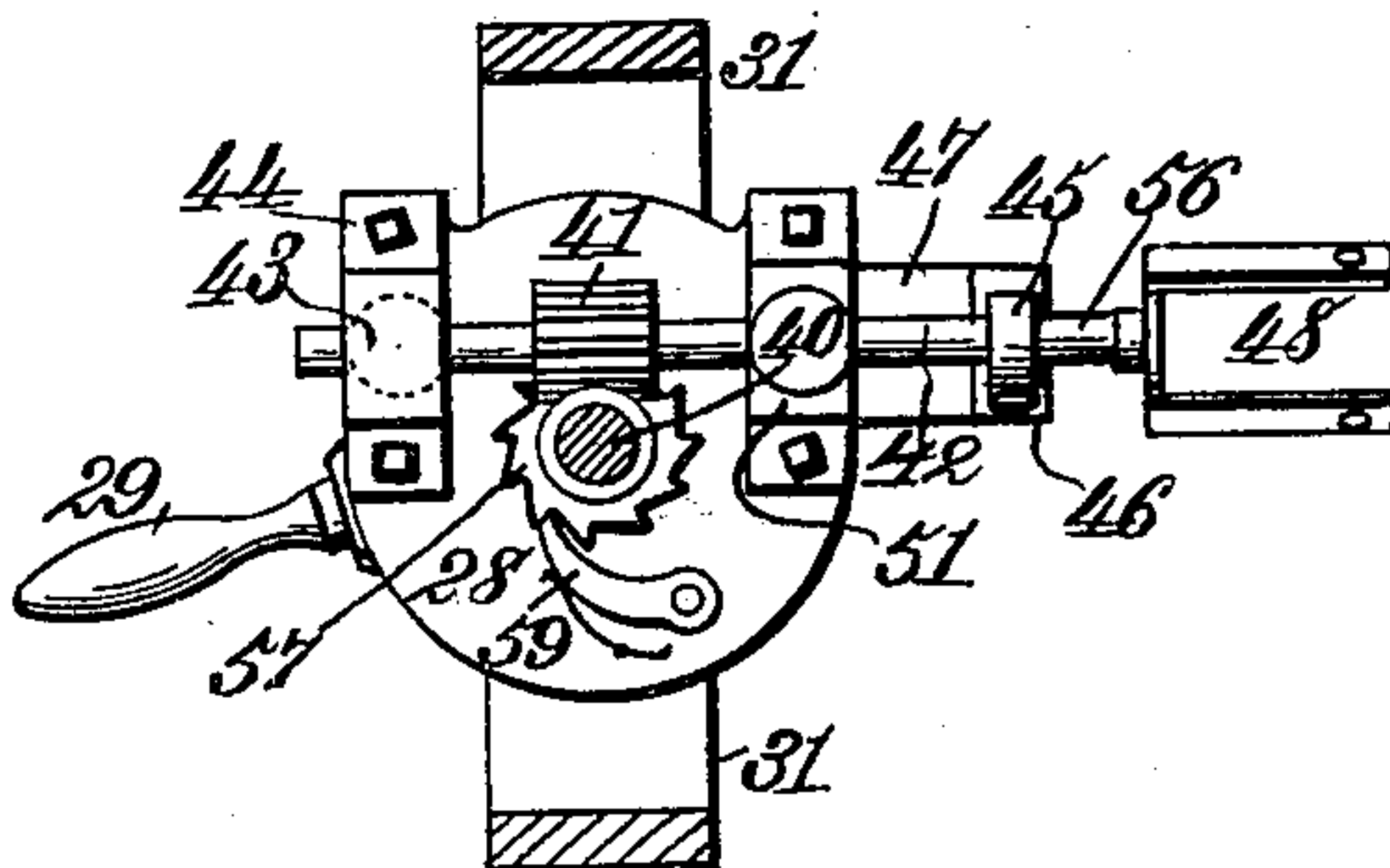


Fig. 5.

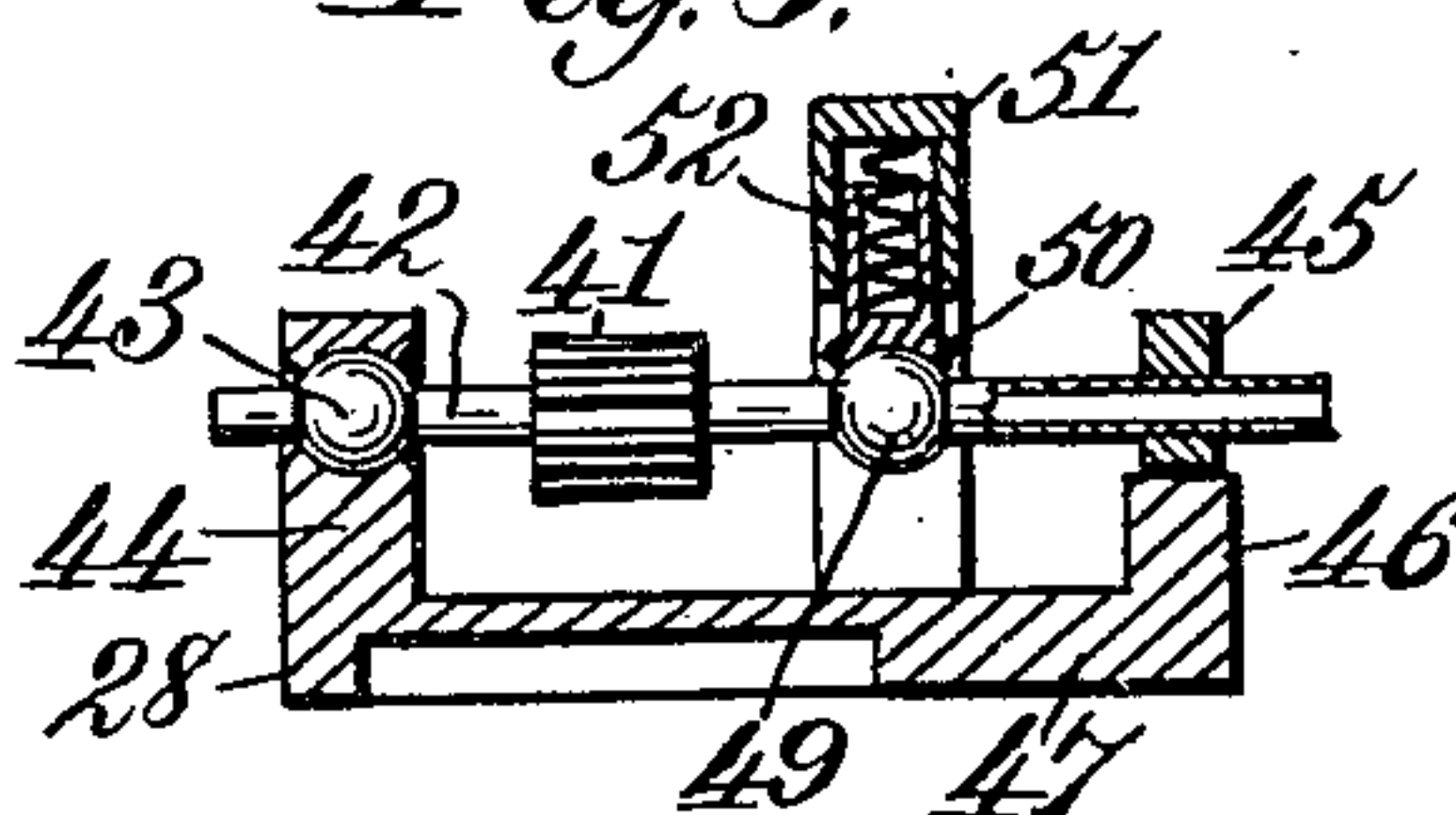


Fig. 7.

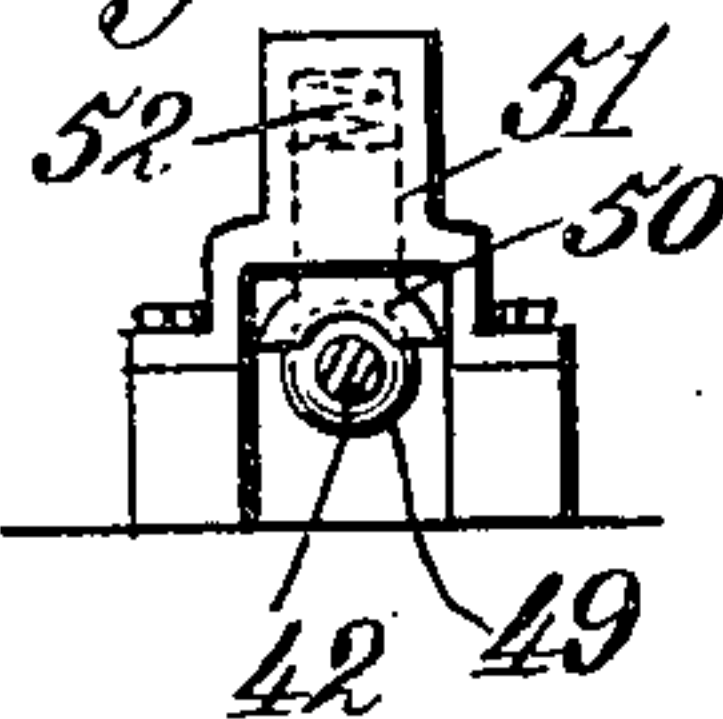


Fig. 6.

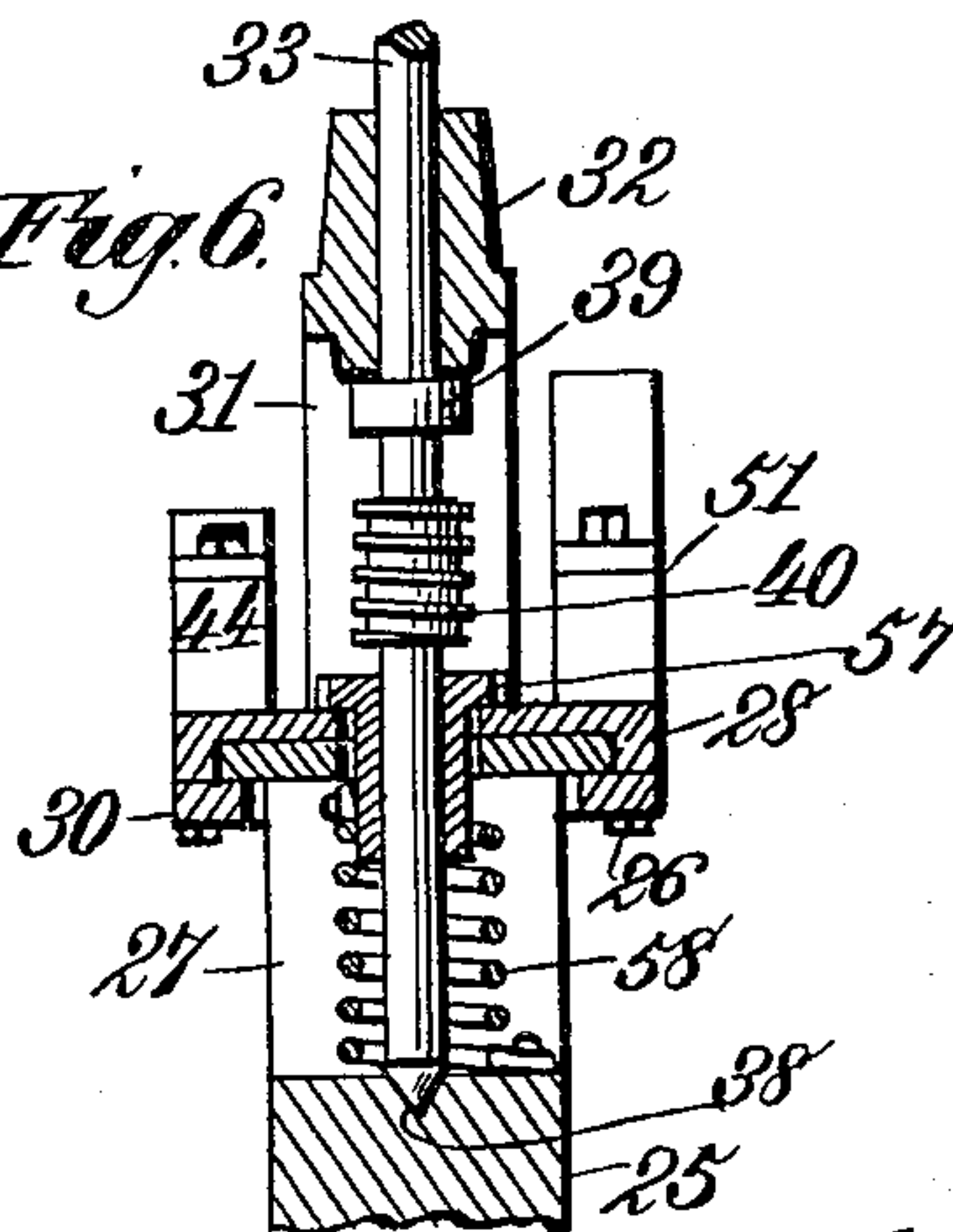
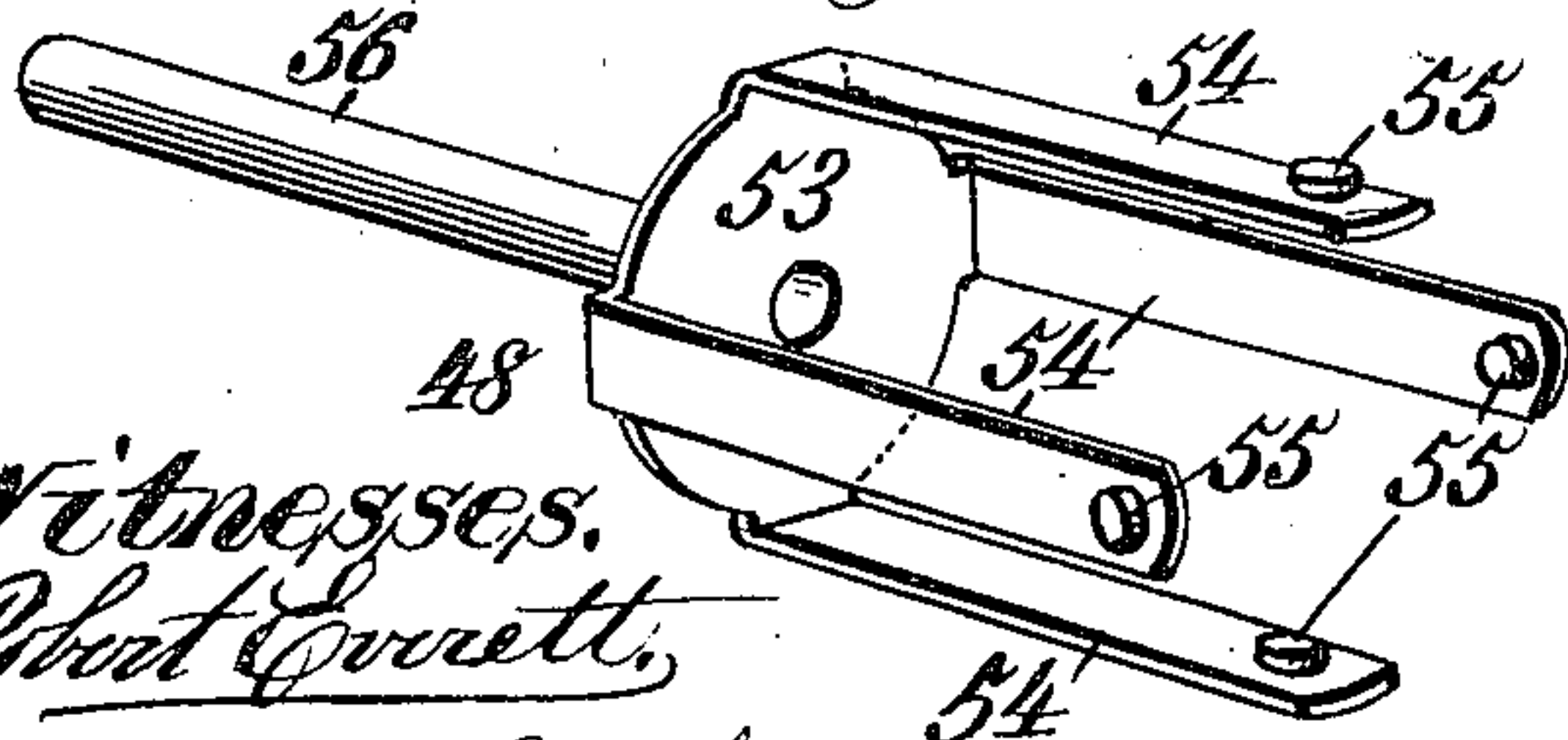


Fig. 8.



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# UNITED STATES PATENT OFFICE.

ANTON ROEMISCH, OF MORGANTOWN, WEST VIRGINIA.

## APPARATUS FOR GRINDING AND SMOOTHING GLASS.

SPECIFICATION forming part of Letters Patent No. 667,579, dated February 5, 1901.

Application filed September 10, 1900. Serial No. 29,567. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON ROEMISCH, a citizen of the United States, residing at Morgantown, in the county of Monongalia and State of West Virginia, have invented new and useful Improvements in Apparatus for Grinding and Polishing or Smoothing Glassware, such as tumblers, lamp-chimneys, and similar articles, of which the following is a specification.

10 This invention relates to apparatus for grinding and polishing or smoothing glassware, such as tumblers, lamp-chimneys, and other similar articles.

15 One object of the invention is to provide simple and convenient mechanism more particularly designed for removing the rough edges of tumblers by means of a rotary grindstone and novel mechanism for rotating the tumbler or other article while in contact with said rotary grindstone and for moving the article up and down on the grinding-surface to secure a uniform grinding action and avoid scoring or grooving of the grindstone.

25 Other objects and advantages of the invention will more fully hereinafter appear.

My invention consists in features of construction and novel combinations of devices in apparatus for grinding and polishing or smoothing glassware, as hereinafter described and claimed.

30 In the accompanying drawings, Figure 1 is an elevation, partly in section, of my improved apparatus for grinding and polishing or smoothing glassware. Fig. 2 is a plan of the same. Fig. 3 is an enlarged detail view of that part of the apparatus which is concerned in supporting and rotating the spindle by which the glass-holder is carried. Fig. 4 is a part-sectional plan of a portion of the apparatus, showing the table in which is supported the rotary spindle for carrying the glass-holder. Fig. 5 represents a vertical section through the table in which is supported the rotary spindle for the glass-holder. Fig. 45 6 is a part-sectional elevation through the portion of the standard that supports the table in which is mounted the spindle for the rotary glass-holder. Fig. 7 is a detail view at right angles to Fig. 5, with the spindle of the glass-holder in transverse section. Fig. 8 is an enlarged view of the glass-holder.

Referring first to Fig. 1, the numeral 1 designates any suitable bed on which a vertically-arranged yoke-frame 2 is supported.

In this yoke-frame 2 there is supported a transversely-arranged bar 3, having a centrally-located bearing 4 on its upper side. Said bearing 4 receives a steel ring 5, located beneath a taper bushing 6 on a vertical shaft 7, that is provided with a bearing 8 in the central upper portion of the yoke-frame. The shaft 7 has also another bearing 9 in any suitable overhead support.

On the vertically-arranged shaft 7 there is secured a grindstone 10, by means of nuts 11 and 12, that will serve to tighten said stone on its shaft. The grindstone-shaft 7 may be rotated by means of power applied to a pulley 13, conveniently located on said shaft. On its lower end the shaft 7 carries a bevel-gear 14, meshing with a bevel-gear 15 on one end of a transversely-arranged shaft 16, journaled in any suitable bearing or bearings, as shown. This shaft 16 carries a worm-gear 17, meshing with a worm-wheel 18 on the lower end of the vertically-arranged spindle 19, that is provided with a bearing in a bracket 20 on one side of the yoke-frame 2, as shown. On its upper end the spindle 19 carries a pinion 21, Figs. 1 and 2. This pinion 21 meshes with and drives an internally-toothed ring 22, as shown. The internally-toothed ring 22 encircles the yoke-frame 2 and is supported on antifriction-rollers 23, journaled in vertical bracket-arms 24, that may be in turn supported on the bed of the apparatus. Any suitable number of these brackets and their antifriction-rollers may be provided to afford adequate and uniform support for the rotary internally-toothed ring.

90 The rotary internally-toothed ring 22 carries a plurality of standards 25, Figs. 1 and 2, arranged at suitable intervals on said ring, the purpose of the rotary ring 22 being to cause said standards to revolve around the grindstone. All the standards 25 and their hereinafter-described attachments are of the same construction, and therefore a description of one will suffice for all. At its upper end each standard 25 is provided with a flanged head 26, Figs. 1 and 6, above a recess or bifurcation 27, that is formed in said standard. On this flanged head 26 there is placed a circular horizontally-shiftable table 28, with



a handle 29, by which the said table can be shifted with a partly-rotary motion, for a purpose hereinafter explained. As shown in Figs. 5 and 6, the shiftable table 28 is circularly recessed on its under side to fit over the flanged head 26 of the standard 25 and may be secured thereon by means of a ring 30, Fig. 6.

To each standard 25 there is secured a yoke-frame 31, Figs. 1, 2, 3, 4, and 6, which overhangs the shiftable table 28, as shown. This yoke-frame 31 provides in its upper central portion a bearing 32 for a vertically-arranged shaft 33, to an upper portion of which is secured a pulley 34, driven by means of a pulley 35, Figs. 1 and 2, from a pulley 36 on the shaft 7 of the rotary grindstone. The pulley 36 is provided with a plurality of circumferential grooves 37, corresponding with the number of standards 25 and pulley-shafts 33 employed in the machine. It will be understood, of course, that the number of standards 25 and their accompaniments will be varied according to the number of pieces of glassware that are to be ground or smoothed at the same time, and obviously I do not confine myself to any particular number of such devices.

Each pulley-shaft 33 is provided at its lower end with a step-bearing 38, Fig. 6, in the bifurcated or recessed upper end of the standard 25, as shown. A collar 39 is provided on each pulley-shaft 33, immediately below the upper bearing 32 of said shaft, the purpose of said collar being to prevent the pulley-shaft from jumping upward from its step-bearing. On the shaft 33 there is also a worm-gear 40, Figs. 3, 4, and 6, meshing with a worm-wheel 41, Figs. 4 and 5, on the spindle 42, that is mounted horizontally on the shiftable table 28, as shown. Near one end the spindle 42 is provided with a ball-bearing 43 in the socketed portion of a standard 44 on the shiftable table 28, and near its other end the said spindle 42 carries an eccentric 45, rotating on the raised surface 46 of an arm 47, that projects from one side of said table. Obviously as the spindle 42 is rotated through the worm-gearing 40 41 the revolution of the eccentric in contact with the raised surface 46 will cause said spindle to oscillate up and down, thereby causing the article of glassware carried by the holder 48 to move up and down on the periphery of the grindstone. In order to provide a positive means for pressing the eccentric 45 against the raised surface 46, the spindle 42 may carry a ball 49, rotating in contact with the socketed or concave under side of the spring-pressed bearing or cap 50, Figs. 5 and 7, that is supported in a suitable bracket 51 on the shiftable table 28, in which said spindle is mounted. The upper portion of bearing 50 is made tubular to inclose a spiral spring 52 for pressing downward said spindle and its eccentric 45 in close contact with the raised surface 46, on which said eccentric revolves.

The glass-holder 48 may consist of a disk 53, having projecting from one side a plurality of spring-arms 54 to grasp the glass article, such as a tumbler. In each of these spring-arms there may be supported a piece of elastic material 55 to exert a suitable holding-friction on the article of glassware without subjecting the same to injury. From the central portion of the disk 53, on its opposite side, there projects a stem 56, Figs. 4 and 8, which may be made tubular to fit over or onto the rotary spindle 42, or the said stem 56 may be fitted into a tubular recess in one end of said spindle, and it is preferable to connect these parts by a taper fit.

On each vertical pulley-shaft 33 there is loosely placed a ratchet-wheel 57, Figs. 4 and 6, having a depending hub, to which is secured one end of a coil-spring 58, the other end of which is fastened to the bottom of the bifurcation or recess 27 on the top of the standard 25, as shown. Now by rotating this loose ratchet-wheel 57 in the proper direction the tension of the attached spring 58 may be increased or diminished in order to control the pressure of the glass article against the grindstone, according to the thickness of the article to be smoothed, a spring-pawl 59 being mounted on the table 28 to engage the teeth of the ratchet-wheel and through which the tension of the spring 58 is exerted on said table to hold the glass article against the grindstone with a variable yielding pressure.

In operating the machine the glass article to be ground or smoothed will be placed in the respective holders 48, being held therein by friction of its spring-arms 54. By means of its handle 29 each shiftable table 28 will now be partially rotated a sufficient distance to bring the edge of each glass article against the periphery of the grindstone. Through the rotation of the grindstone-shaft 7 the grindstone will be revolved and at the same time the rotary motion of said shaft 7 will be transmitted through the bevel-gearing 14 and 15, shaft 16, and its worm-gearing to the shaft of the pinion that imparts rotary motion to the internally-toothed ring 22, thereby causing the several standards 25 to revolve around the grindstone. The vertical pulley-shaft 33, mounted on or above each standard 25, is at the same time rotated through the belting of each pulley 34 to the pulley 37 on the grindstone-shaft. Each vertical pulley-shaft 33 transmits rotary motion through the worm-gearing 40 and 41 to the horizontally-arranged spindle 42, that carries the glass-holder 48, and as this spindle 42 is revolved the eccentric 45 thereon causes said spindle to oscillate in a vertical direction, thereby shifting the glass article vertically along the periphery of the revolving grindstone, consequently contributing to a uniformity of grinding action and at the same time avoiding unequal wear of the grindstone. When it is desired to discontinue the grinding of the glass article or to replace them with



others, it is only necessary to shift each table 28 by means of its handle 29 in such direction as to carry the glass article away from the grindstone, and this can be done without stopping the machine. Each glass article when properly smoothed or finished can be readily disengaged from its holder without the exertion of any considerable force.

The described machine may have a capacity for grinding, smoothing, or finishing at one time a set of glass articles comprising any required number, and the construction of the several parts of the machine is very simple and durable and not likely to get out of order.

What I claim as my invention is—

1. In apparatus for grinding glassware, the combination of a vertically-arranged driving-shaft having a grindstone thereon, a horizontally-arranged shaft driven by bevel-gearing from the grindstone-shaft, a pinion having its shaft driven from said horizontally-arranged shaft through worm-gearing, an internally-toothed ring driven from said pinion, a plurality of standards supported on and carried by said ring, a horizontally-shiftable table mounted on each of said standards, a rotatable spindle mounted horizontally on each table and provided with a worm-wheel, a vertical pulley-shaft driven by belting from a pulley on the grindstone-shaft and provided with a worm-gear meshing with the worm-wheel on said spindle, and a glass-holder carried by said spindle, substantially as described.

2. In apparatus for grinding glassware, the combination of a frame having a vertically-arranged driving-shaft mounted therein, a grindstone carried by said shaft, a rotary ring encircling the frame in which the driving-shaft is mounted, gearing for driving said rotary ring from the grindstone-shaft, a plurality of standards mounted on and carried by said rotary ring, a horizontally-shiftable table mounted on each of said standards, a rotary and vertically oscillatory spindle mounted horizontally on each table, means for rotating said spindle from the driving-shaft on the grindstone, and a glass-holder carried on each of said spindles, substantially as described.

3. In apparatus for grinding glassware, the combination of a horizontally-arranged rotary grindstone, a vertical power-shaft on which said grindstone is carried, a rotary horizontally-supported ring driven from the shaft of the grindstone, a plurality of standards mounted and carried by said ring, a horizontally-shiftable table mounted on each standard, a rotary and vertically oscillatory spindle mounted horizontally on each table, means for rotating said spindle from the grindstone-shaft, a glass-holder carried by each spindle, and means for varying the pressure of the article contained in said holder against the periphery of the grindstone, substantially as described.

4. In apparatus for grinding glassware, the combination of a horizontally-arranged grindstone having a vertical driving-shaft, a rotary ring driven from the grindstone-shaft, a plurality of standards mounted on and carried by said ring, a horizontally-shiftable table mounted on each standard, a rotary spindle mounted horizontally on each table, a glass-holder carried by each spindle, a vertical pulley-shaft driven from the grindstone-shaft, worm-gearing connecting said vertical shaft with said spindle, a ratchet-wheel loose on said vertical pulley-shaft, a coil-spring secured to said ratchet-wheel at one end and to the standards at its other end, and a spring-pawl carried on each table to engage with said ratchet-wheel, whereby through adjustment of said ratchet-wheel the tension of said spring may be varied to control the pressure of the article of glassware against the periphery of the grindstone, substantially as described.

5. In apparatus for grinding glassware, the combination of a horizontally-arranged grindstone having a vertical driving-shaft, a rotary ring driven from the grindstone-shaft, a plurality of standards mounted on and carried by said ring, a horizontally-shiftable table mounted on each standard, a rotary spindle mounted on each table and provided with an eccentric in contact with the raised surface of said table, a vertical pulley-shaft driven from the grindstone-shaft and connected with said spindle through worm-gearing, a glass-holder carried by said rotary spindle, and means for causing the eccentric of said rotary spindle to bear with a yielding pressure on the raised surface of the table, substantially as described.

6. In apparatus for grinding glassware, the combination of a horizontally-arranged grindstone, a driving-shaft for said grindstone, a rotary ring driven from the grindstone-shaft, a plurality of standards mounted on and carried by said ring, a horizontally-shiftable table mounted on each standard, a rotary spindle mounted horizontally on each table and having a ball-bearing at one end, a bracket mounted on said table, a yielding cap in said bracket, a ball-bearing on said spindle in contact with the under side of said cap, an eccentric on said spindle in contact with the raised surface of the table, and a glass-holder carried by said spindle, substantially as described.

7. In apparatus for grinding glassware, the combination with a horizontally-mounted grindstone having a vertical shaft, of a rotary ring driven from the grindstone-shaft, a plurality of standards mounted on and carried by said ring, a horizontally-shiftable table mounted on each standard, a rotary spindle mounted horizontally on each table, a glass-holder carried by said spindle, an eccentric on said spindle in contact with the raised surface of the table, means for causing said eccentric to bear with a yielding pressure on said raised surface of the table for im-



parting an upward and downward oscillation to said rotary shaft, means for varying the pressure of the article of glassware against the periphery of the grindstone, substantially as described.

8. In apparatus for grinding glassware, the combination with a grindstone and a rotary ring driven from the grindstone-shaft, of a plurality of shiftable tables mounted on and carried by said rotary ring, a rotary spindle mounted on each table, means for imparting a vertical and oscillatory movement to each rotary spindle, and a glass-holder carried by each spindle consisting of a disk portion having a stem for attachment to the spindle and a plurality of spring-arms to grasp the article of glassware and hold it in contact with the periphery of the grindstone, substantially as described.

9. In apparatus for grinding glassware, the combination of a grindstone having a vertically-arranged shaft, a rotary ring driven from the grindstone-shaft, a plurality of standards mounted on and carried by said ring, a hori-

zontally-shiftable table on the top of each standard, a vertically-arranged shaft driven from the grindstone-shaft and connected with said rotary spindle through worm-gearing, a ratchet-wheel loose on said shaft, a spring having one end attached to said ratchet-wheel and the other end to said standard, a pawl on said table in engagement with said ratchet-wheel whereby through adjustment of said ratchet-wheel the tension of the spring on said table may be increased or diminished, means for imparting vertical oscillation to said spindle in its rotation, and a glass-holder carried by said spindle to hold an article of glassware in contact with the periphery of the grindstone, substantially as described.

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

ANTON ROEMISCH.

Witnesses:

FRANK CAPLES,  
R. L. LONG.