

No. 668,790.

Patented Feb. 26, 1901.

F. WOODRUFF.

APPARATUS FOR GRINDING GLASSWARE.

(No Model.)

(Application filed Nov. 11, 1899.)

3 Sheets—Sheet 1.

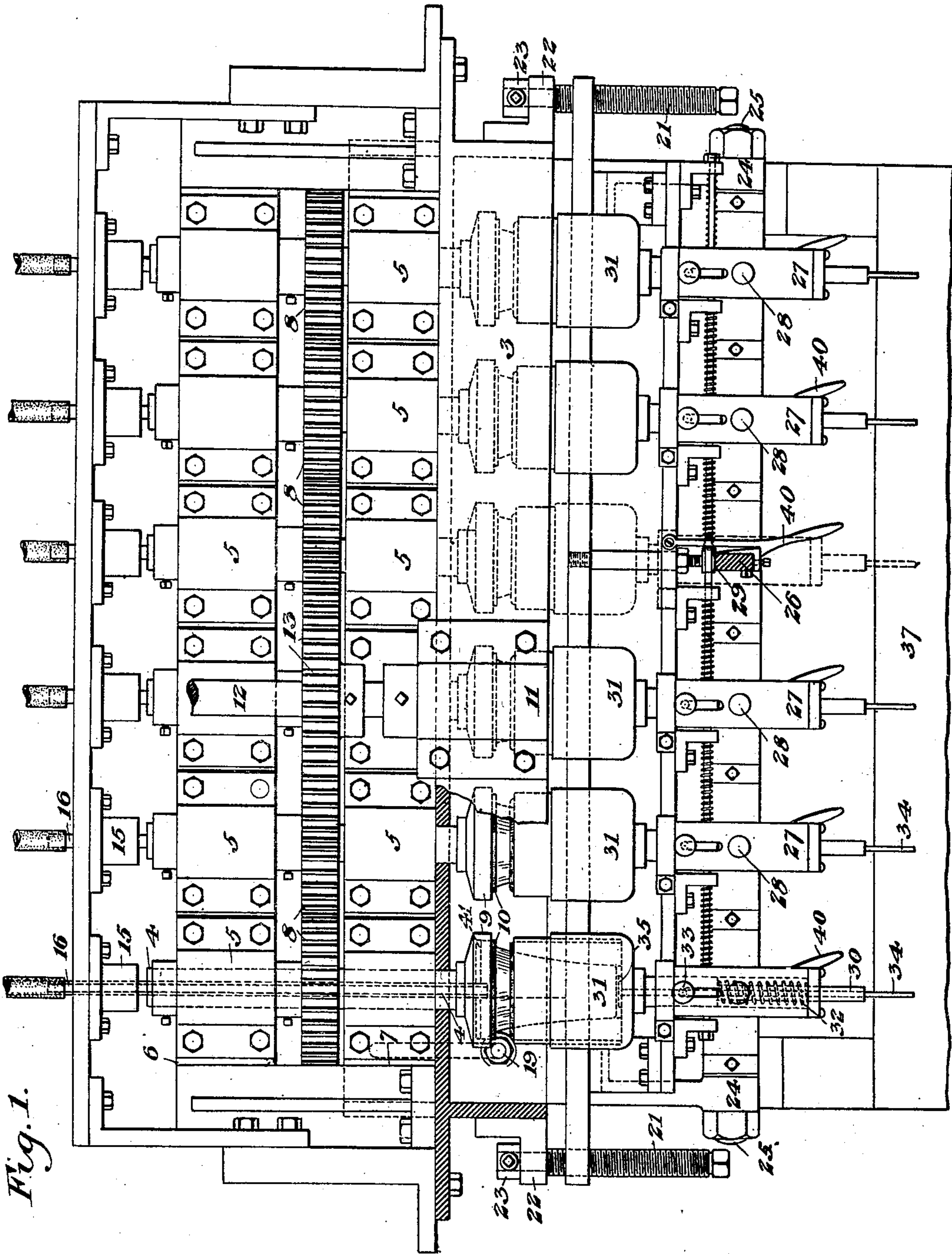


Fig. 1.

WITNESSES

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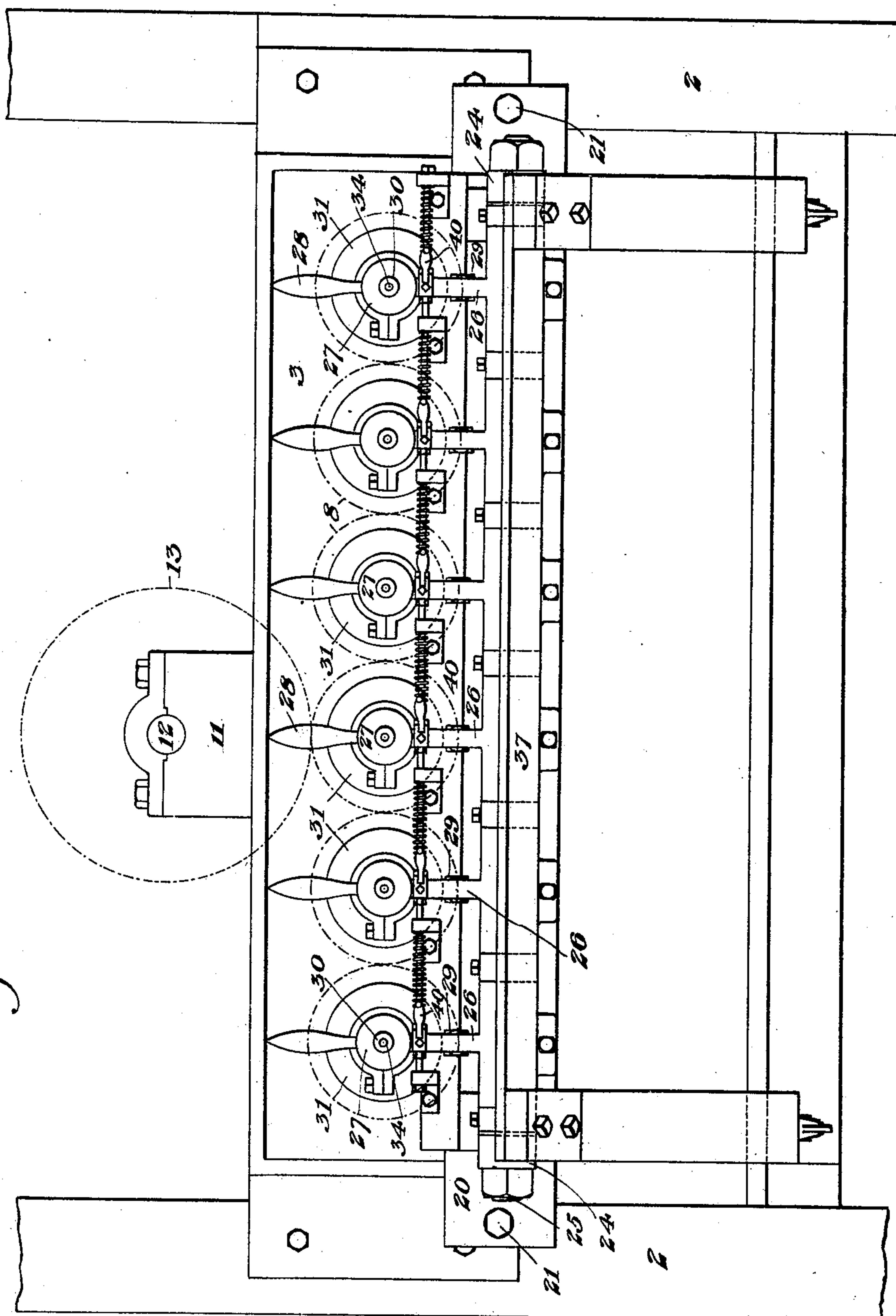
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3 Sheets—Sheet 2.

Fig. 2.



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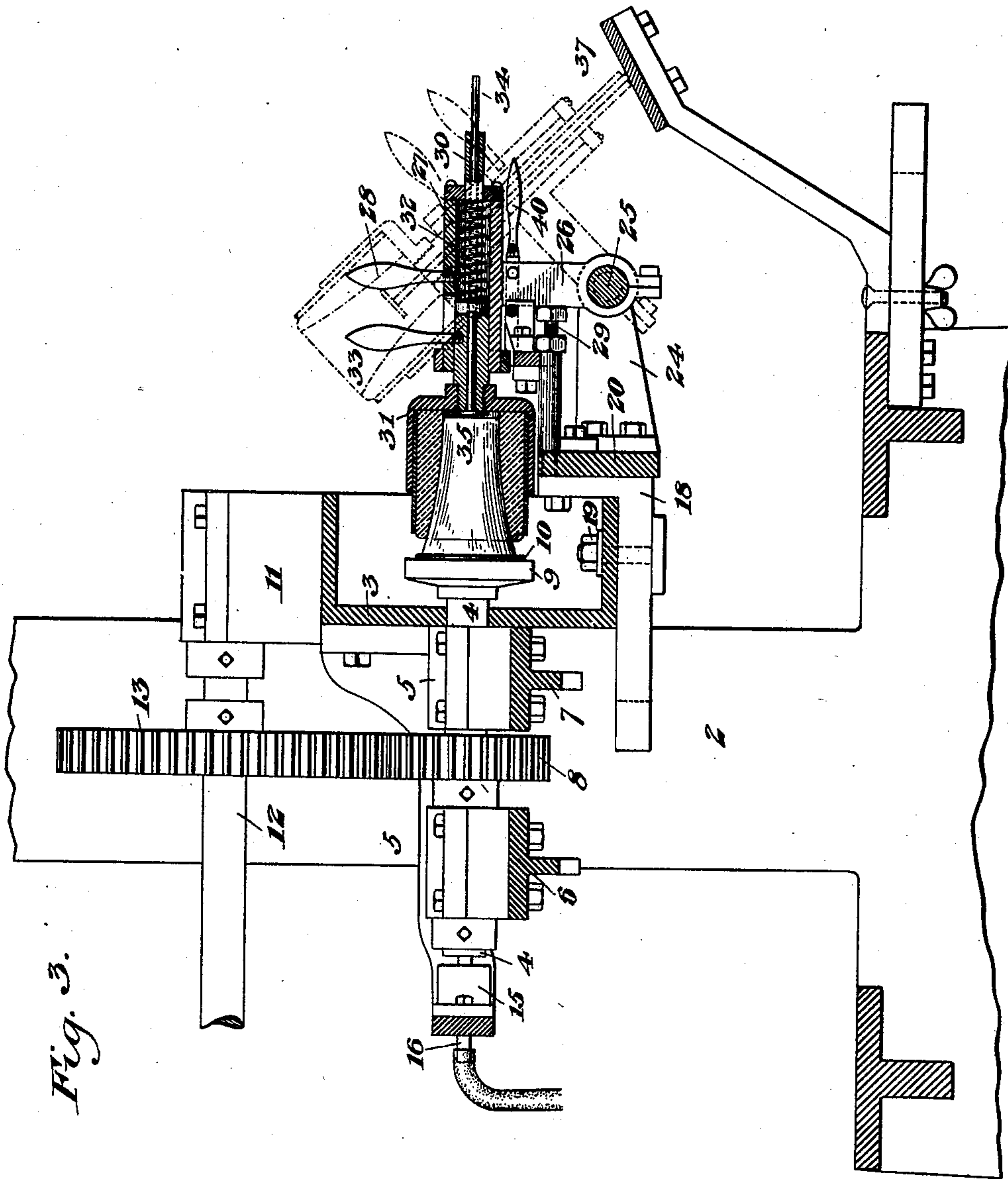
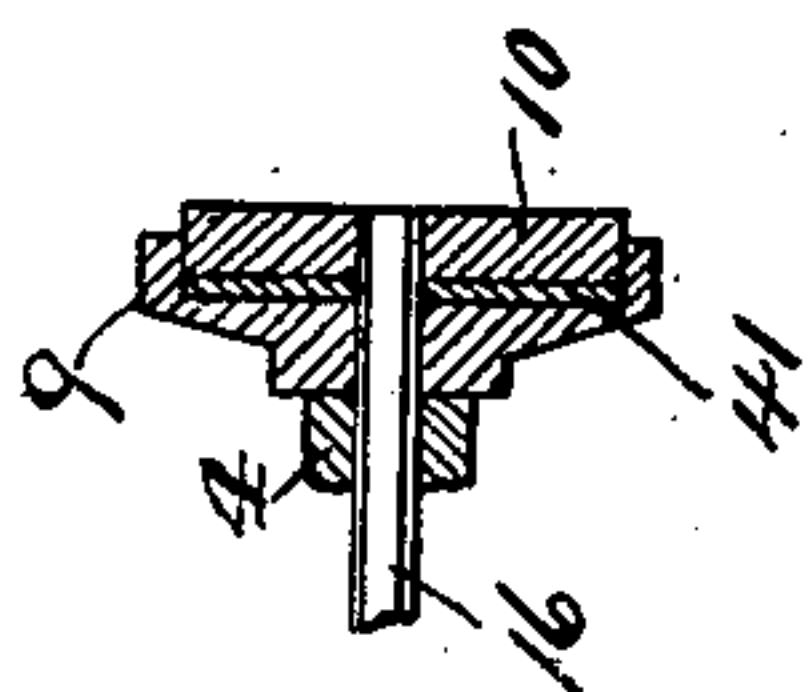


Fig. 3.

Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK WOODRUFF, OF ROCHESTER, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL GLASS COMPANY, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR GRINDING GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 668,790, dated February 26, 1901.

Application filed November 11, 1899. Serial No. 736,599. (No model.)

To all whom it may concern:

Be it known that I, FRANK WOODRUFF, of Rochester, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Grinding Glassware, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved apparatus for grinding glassware. Fig. 2 is a front elevation, and Fig. 3 is a vertical sectional view, of the same. Fig. 4 is a detached sectional view of one of the grinders.

Like numerals of reference indicate like parts wherever they occur.

My invention relates to an improvement in apparatus for grinding the edges of tumblers and like articles of glassware. In the manufacture of blown glassware, such as tumblers, after the tumbler is blown there remains a portion to which the blowpipe has been connected, which is cut off in one of various ways, either by scoring it with a diamond and then heating it or by revolving the article rapidly and encircling it with a wire which becomes so heated by the friction that when moisture or cold is applied to the glass the blow-over portion cracks off. These modes, however, leave a rough or sharp edge on the tumbler or other article of glassware, which ordinarily has been removed by hand labor, the operator holding the edge of the tumbler against a revolving grindstone until the rough sharp edges have been ground away. In a large factory many operators and grindstones are required for this purpose, involving the expenditure of much labor and power.

The object of my invention is to provide an improved mechanism for grinding the edges of tumblers and other articles of glassware.

I will now describe my invention, so that others skilled in the art to which it appertains may manufacture and use the same; and to this end I have shown and described six separate grinders arranged side by side and driven from a common driving-shaft, the grinders being duplicates of each other. I do not desire, however, to limit my invention to any number of grinders.

In the drawings, 2 represents the frame of the apparatus, to the front portion of which

is secured an open box or casing 3, through the back wall of which extend the hollow spindles 4 of the grinders, which spindles are mounted in suitable bearings 5, which are secured to the cross-bars 6 and 7. These cross-bars should be perfectly level to form an even support. The reason that the several bearings are detached or separate from each other is to allow for adjustment of the parts as they wear. Keyed to the spindles 4 between the bearings 5 are gear-wheels 8. On the end of each of the spindles 4 within the box 3 is secured the disk 9, which is provided with a recess within which is secured the grinding stone or disk 10. As shown in the drawings, I have arranged three of the spindles and disks to revolve toward the right and three to revolve toward the left, which enables them to be driven by a central gear-wheel. Placed on top of the box or casing 3 is a bearing or pillow block 11, in which is journaled the driving-shaft 12. This shaft is placed directly above the third of the hollow spindles 4 and is provided with a gear-wheel 13, which meshes with the gear-wheel 8 of the third spindle 4, and as the gear-wheels 8 mesh one with the other power is applied from the gear-wheel 13 to each of the spindles 4, three revolving toward the right and three revolving toward the left. The gear-wheel 13, as shown in the drawings, is twice the diameter of the gear-wheels 8.

At the rear of the frame 2 the end of each of the hollow spindles 4 is connected with a suitable coupling 15 and a rubber hose, by means of which water is fed to a pipe 16, that extends through the hollow spindle 4 to and through the face of the metal disk 9 and grinding-stone 10, the pipe being held stationary within the revolving spindle. On the bottom of the box 3 are suitable guideways, in which are placed L-shaped brackets 18, which are adjustably secured to the bottom of the casing 3 by the T-bolts and nuts 19. Bolted to these brackets 18 is a cross-bar 20, which extends along the entire front of the apparatus, and at each end this bar is tapped for the reception of the guide-screws 21. On each end of the box 3 is a lug 22, having a hole or socket for the reception of the ends of the guide-screws 21, which guide-screws are secured in these sockets by the collars 23.

The chuck-arms that support the chucks which hold the tumblers against the grinders are secured to the bar 20, as is hereinafter described, and the object of these parts is to permit of the adjustment of the bar 20 and the consequent adjustment of the chucks toward or away from the grinders 10 to suit longer or shorter tumblers. In order to adjust the bar 20, the nuts 19 are loosened and the guide-screws 21 are turned until the bar is in the desired position. Near each end of the cross-bar 20 and at the middle of the same is bolted an arm 24. Extending through the arms 24, parallel with the bar 20, is a rod or shaft 25, and pivotally mounted on the rod 25 are six chuck-arms 26, one in front of each of the grinders 10. These chuck-arms are adapted to swing forward toward the grinders and away from the same, and they are provided with a cylindrical arm 27 at right angles to the arms 26 and also with a handle 28. In the face of the cross-bar 20 are secured six adjustable stops 29, which are for the purpose of limiting the forward movement of the arms 26, and thereby insure that the arms 27 shall be in a horizontal line with the center of the grinders 10.

In the bore of the cylindrical arm 27 is placed a hollow shaft 30, to the end of which is secured the chuck-holder 31. This shaft 30 is turned down or lessened in outer diameter for part of its length and is surrounded by a spiral spring 32, which tends to press the shaft forward. The arms 27 are held in their forward position by the latch-handles 40, which are pivoted to the cross-bar 20 and are arranged to engage with the arms 26. On top of the arm 27 is a slot through which a handle 33 passes and is fixed to the shaft 30. The handle 33 and the handle 28 are adjacent to each other, so that by grasping them both in the hand the workman may retract the handle 33, the spring 32 being compressed. Passing through the center of the shaft 30 is an ejector-rod 34, having a flat head 35, which rests at the base of the chuck-holder 31. The other end of the ejector-rod extends beyond the end of the hollow shaft 30. When the chuck-arms 26 are thrown back, the ends of the ejector-rods 34 come in contact with a plate 37, and thereby the head of the ejector-rod is pushed forward in the chuck 31 and unseats the tumbler therein, allowing of its removal by the hand of the workman.

The operation is as follows: Water is supplied to the grinders 10 by the water-pipes 16, and power is applied to the shaft 12, and thereby to the grinders, causing them to revolve. The arm 27 being thrown back in the position shown by the dotted lines in Fig. 3, the tumbler is placed in the chuck 31, with the end to be ground outermost. The handle 28 is then drawn back, which retracts the chuck-holder shaft 30, and the arm 27 is thrown forward, which brings the center of the tumbler in the chuck opposite the center of the grinding-stone 10. By releasing the

handle 28 the spring carries the shaft 30 and the chuck 31 forward, bringing the rough edge of the tumbler against the surface of the rapidly-revolving grinding-disk and retaining it there with a spring-pressure until the edge is ground smooth. The handle 28 is then retracted by the grasp of the hand of the workman, the arm 27 is swung back, and the end of the ejector-rod 34 strikes the plate 37, and the tumbler being thereby unseated in the chuck is removed, an unground tumbler is put in the chuck, and the operation is repeated.

Between the grinding-stones 10 and the metal disks 9 are soft-metal disks 41, which act as cushions to the grinding-stones and prevent breaking of the glass in grinding.

The advantages of my invention will be apparent to those skilled in the art.

What I claim is—

1. In apparatus for grinding glassware, the combination of a rotatory grinder, a water conduit passing through the grinder, a swinging arm, and a chuck mounted on said arm and adapted to be given a longitudinal movement toward and away from the grinder.

2. In apparatus for grinding glassware, the combination of a rotatory grinder, a water-conduit passing through the grinder, a vertically-swinging arm, a chuck mounted on said arm and adapted to be given a longitudinal movement toward and away from the grinder, and a spring for forcing the chuck toward the grinder.

3. In apparatus for grinding glassware, the combination of a rotatory grinder, a water-conduit passing through the grinder, a swinging arm, a chuck mounted on said arm and adapted to be given a longitudinal movement toward and away from the grinder, and a stop to hold the chuck on a line at right angles to the plane of the face of the grinder.

4. In apparatus for grinding glassware, the combination of a rotatory grinder, a movable chuck-holder consisting of a hollow supporting-arm having a central spindle, a spring for pressing the spindle forward, and a handle for retracting the central spindle.

5. In apparatus for grinding glassware, the combination of a rotatory grinder, a chuck-holder consisting of a hollow arm, a central spindle, a spring for pressing the spindle forward, and a latch for holding the hollow arm in its forward position.

6. In apparatus for grinding glassware, the combination of a series of rotatory grinders, a series of chuck-holders, a movable cross-bar on which the chuck-holders are mounted, and guide-screws for adjusting the distance of the cross-bar and the chuck-holders from the grinders.

In testimony whereof I have hereunto set my hand.

FRANK WOODRUFF.

Witnesses:

H. M. CORWIN,

JAMES K. BAKEWELL.