

No. 828,894.

PATENTED AUG. 21, 1906.

J. G. MARTIN.
MACHINE FOR DRILLING GLASSWARE.

APPLICATION FILED JULY 25, 1905.

2 SHEETS—SHEET 1.

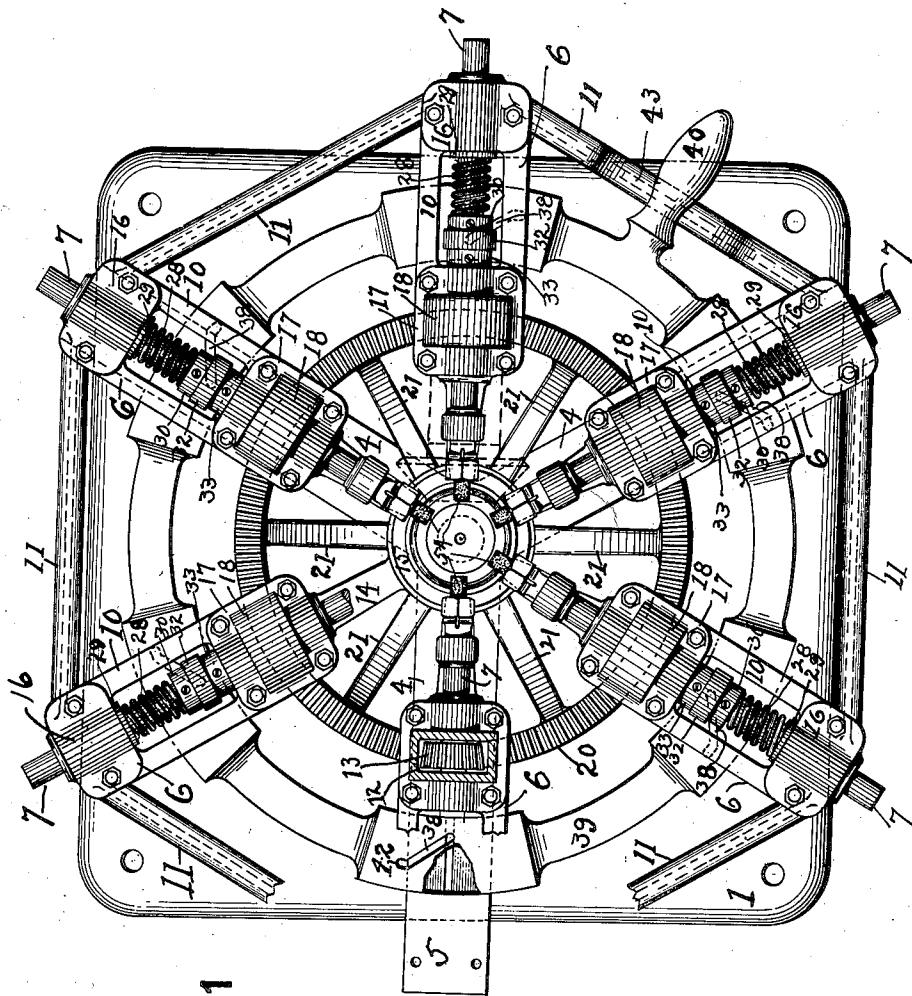


FIG. 1

WITNESSES.

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Robert C. Follen

INVENTOR.

Joseph G. Martin
By *Kay, Follen & Winter*
His Atty

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2 SHEETS—SHEET 2.

FIG. 2

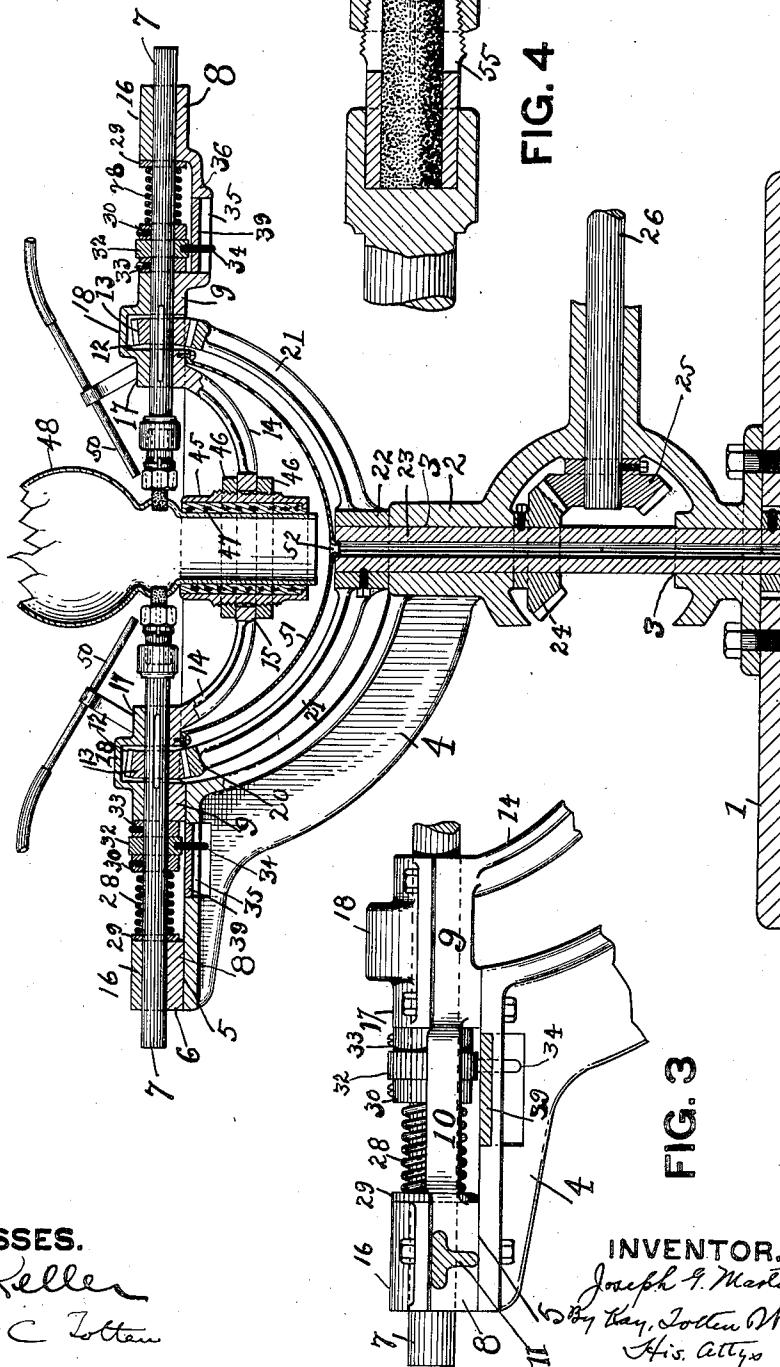


FIG. 4

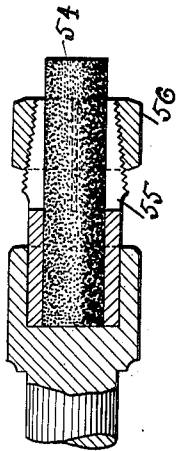
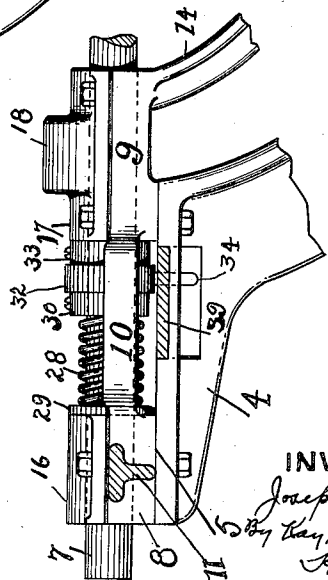


FIG. 3



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH G. MARTIN, OF FOSTORIA, OHIO, ASSIGNOR TO CANUTE L. BRUDEWOLD, OF CAMBRIDGE, OHIO.

MACHINE FOR DRILLING GLASSWARE.

No. 828,894.

Specification of Letters Patent.

Patented Aug. 21, 1906.

Application filed July 25, 1905. Serial No. 271,245.

To all whom it may concern:

Be it known that I, JOSEPH G. MARTIN, a resident of Fostoria, in the county of Seneca and State of Ohio, have invented a new and useful Improvement in Machines for Drilling Glassware; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a drilling-machine, and more especially to a multiple-spindle machine for drilling hollow glassware and similar articles.

The object of the invention is to improve machines of this character in details of arrangement and construction hereinafter described.

In the accompanying drawings, Figure 1 is a plan view of my machine, one of the spindle-bearings being broken away. Fig. 2 is a central vertical section. Fig. 3 is a side view, on an enlarged scale, of a portion of the frame and one of the spindle-bearings; and Fig. 4 is a longitudinal section of one of the chucks.

My machine will be provided with any suitable base, such as shown at 1, carrying the standard or frame 2, which is provided with vertical bearings 3 and with three or more arms 4, which project radially outwardly and upwardly. These arms at their upper ends are provided with horizontal faces 5, upon which rest bearing members 6 for the drill-spindles 7. As many bearing members 6 will be provided as there are spindles in the machine, the particular machine illustrated having six radially-arranged spindles. The bearing members 6 have two bearing-sections 8 and 9 united by side members or bars 10. The several bearing members are connected by means of the braces 11, which are shown as cast integral with the bearing members. This, however, is not necessary, as they may be formed of separate pieces suitably secured together. At their inner ends the bearing members are provided with transverse openings 12 for receiving the beveled pinions 13 on the drill-spindles 7. At their extreme inner ends these bearing members are provided with arms 14, which project inwardly and downwardly and are connected to a ring 15 for receiving a suitable work-holder. As shown in the drawings, the bearing members 6, braces 11, arms 14, and ring 15 are all formed of a single integral

casting; but obviously they may be formed of separate pieces, if desired.

The drill-spindles 7 are held in the bearing members by means of caps 16 and 17, the latter being provided with a hood 18 for covering up the beveled pinion 13. The several beveled pinions 13 are engaged by a toothed rim or crown-gear 20, provided with spokes or arms 21, curving downwardly and connecting the toothed rim with the hub 22. The latter is suitably secured to the upper end of a hollow shaft 23, mounted in the bearings 3 in the base-frame 2. This shaft is provided with a beveled gear 24, which engages a similar gear 25 on a driving-shaft 26, mounted in a bearing formed in one side of the frame 2. The shaft 26 may be driven by any suitable means or in any suitable way. The drill-spindles will be fed toward the work yieldingly. For this purpose I provide spiral springs 28, surrounding the drill-spindles and bearing at their outer end against washers 29, seated against the outer bearing members 8 and at their inner ends bearing against collars 30, secured to the drill-spindles. These springs will rotate with the spindles. In order to withdraw the spindles, I provide on each spindle a collar 32, loose on the spindle and held between the collar 30 and another collar 33, both secured to the spindle. The collar 32 is provided with a downwardly-projecting lug or pin 34, which extends into a slot 35, formed in the arms 4 or bearing members 6, as the case may be, so as to prevent said collar from turning with the spindle. The machine-frame is provided with only three arms 4. Consequently every alternate bearing member 6 will have a slot 35, formed in the bottom connecting member 36, as indicated on the right-hand side of Fig. 2.

The several pins 34 project through cam-slots 38, formed in a ring 39, suitably mounted on the arms 4 and in the bearing members 6. This ring at one side is provided with a handle 40 for operating the same. The several cam-slots 38 project on an angle, as shown in Fig. 1, so that when the ring is turned all of the spindles will be simultaneously withdrawn. At their outer ends the cam-slots are provided with straight portions 42, so that when the spindles have been fully withdrawn they will be held in that position, the pins 34 then resting in the portions 42 of the

slots. In order to feed the spindles forward, the ring is rotated slightly, so as to cause the pins to clear the straight portion 42 of the cam-slots and come into the inclined portions thereof. The springs 28 will then continue to feed the spindles inwardly. One of the braces 11 is provided with a depressed portion 43, as indicated in Fig. 1, to make room for the handle 40.

The work-holder is so constructed as to hold the work yieldingly. It is shown as a sleeve 45, suitably secured in the ring 15 by means of collars or nuts 46 and provided with a cushioning-lining 47, which may be formed of cork, rubber, or other suitable cushioning material. The hollow glass article is shown at 48 as projecting down into the work-holder while the drills are operating thereupon.

In drilling glassware and the like it is necessary to supply water to the part being drilled. For this purpose I supply suitable water-pipes 50 for directing a jet of water against the article at each drill. In order to permit this water to drain away, I secure to the inner end of the bearing members 6 a suitable basin or cup 51, provided in its bottom with an opening 52, which communicates with the opening 53 in the hollow shaft 23, so that the water and grit will be conducted away from the machine.

The drill itself is shown at 54. It is comprised of a suitable body of abrading material. It may be held in any suitable chuck secured to the inner ends of the spindles 7, that shown comprising a split sleeve 55, having an external tapered threaded face for receiving an integral tapered nut 56. Any other chuck will answer the purpose equally as well.

The articles to be drilled are inserted in the machine from above and all of the operating mechanism is underneath, so as to give easy access for the insertion and removal of the articles. Provision is made for draining away the water and grit, so that the latter cannot get into the bearings or gears. In fact, all of the gearing is well housed and protected from the water and grit.

The operation of the machine will be understood from the foregoing description. The machine as a whole is simple of construction, contains a minimum number of parts, and provides for feeding the drills yieldingly as well as holding the article yieldingly, so that breakage is reduced to a minimum.

Various changes may be made in the form and location of the several parts without departing from the spirit of my invention.

What I claim is—

1. In a machine for drilling hollow glassware and the like, the combination of a work-holder, a rotary spindle, means for yieldingly feeding the same toward the work, and means

for withdrawing said spindle, said withdrawing means having a locking position.

2. In a machine for drilling hollow glassware and the like, the combination of a work-holder, a rotary drill-spindle, and a spring for pressing said spindle toward the work.

3. In a machine for drilling hollow glassware and the like, the combination of a work-holder, a rotary drill-spindle, means for yieldingly pressing the spindle toward the work, and a cushioning work-holder in line with the spindle.

4. In a machine for drilling glassware and the like, the combination of a work-holder, a rotary drill-spindle, a spring for pressing the spindle toward the work, and a cam for withdrawing said spindle, said cam having a locking portion.

5. In a machine for drilling glassware and the like, the combination of a frame, a work-holder, a rotating drill-spindle, means for yieldingly feeding the spindle toward the work, a collar loose on said spindle but held against endwise movement thereon, means for preventing said collar from rotating with the spindle, and means for engaging said collar to withdraw the spindle.

6. In a machine for drilling glassware and the like, the combination of a frame and work-holder, a rotating drill-spindle, a spring for yieldingly feeding the spindle toward the work, a collar on said spindle loose thereon but held against endwise movement, a projection on said collar entering a slot in the frame, and a cam for engaging said collar and serving to withdraw said spindle.

7. In a machine for drilling glassware and the like, the combination of a central work-holder, a series of radial spindles, and yielding means for feeding said spindles toward the work.

8. In a machine for drilling glassware and the like, the combination of a central work-holder, a series of radial spindles, yielding means for feeding said spindles toward the work, and a ring concentric with said work-holder and provided with a series of cams for withdrawing said spindles.

9. In a machine for drilling glassware, the combination of a central work-holder, a series of radial drill-spindles, means for yieldingly feeding the said spindles toward the work, a collar loose on each spindle but held against endwise movement thereon, means for preventing said collar from rotating with the spindles, and a ring provided with a series of cams for engaging said collars and withdrawing said spindles.

10. In a machine for drilling glassware and the like, the combination of a frame, a series of horizontal radially-arranged drill-spindles, bearings therefor, a central work-holder carried by said bearings, a pinion on each spindle, a crown-gear engaging said spindles, and

a central vertical shaft carrying said crown-gear.

11. In a machine for drilling glassware and the like, the combination of a series of horizontal radially-arranged drill-spindles, a central work-holder, a gear on each spindle, a horizontal crown-gear engaging said gears, a centrally-located shaft for carrying said crown-gear, and a draining-basin located underneath the work-holder.

12. In a machine for drilling glassware and the like, the combination of a series of horizontal radially-arranged spindles, a central work-holder, a pinion on each spindle, a horizontal crown-gear engaging said pinions, a vertical hollow shaft carrying said crown-gear, and a cup or basin underneath the work-holder and having an opening communicating with the hollow vertical shaft.

13. In a machine for drilling glassware and the like, the combination of a frame, a series of horizontal radially-arranged spindles, bearings on the frame for said spindles, a central work-holder, pinions on said spindles, a crown-gear engaging said spindles, a vertical hollow shaft carrying said crown-gear, and a cup or basin secured to said spindle-bearings and having an opening communicating with said hollow shaft.

14. In a machine for drilling glassware and the like, the combination of a series of horizontal radially-arranged spindles, a central

work-holder, bearings for said spindles, pinions on said spindles, and spindle-bearings having caps covering said pinions, a crown-gear engaging said pinions, a vertical hollow shaft carrying said crown-gear, and a cup or basin connected to said spindle-bearings and having an opening communicating with the hollow vertical shaft.

15. In a machine for drilling glassware and the like, the combination of a series of radially-arranged spindles, and a central work-holder carried by said bearings.

16. In a machine for drilling hollow glassware and the like, the combination of a work-holder comprising a cushioning sleeve, arranged to cushion the work radially to the axes of said sleeve, a drill-spindle acting radially to the axis of said sleeve, and means for yieldingly feeding said spindle toward the work.

17. In a machine for drilling hollow glassware and the like, the combination of a work-holder comprising a sleeve having an elastic lining, a series of spindles acting radially to the axis of said sleeve, and means for feeding said spindles yieldingly toward the work.

In testimony whereof I, the said JOSEPH G. MARTIN, have hereunto set my hand.

JOSEPH G. MARTIN.

Witnesses:

C. L. GUERNSEY,
J. S. BAUMBAUGH.