

No. 709,797.

Patented Sept. 23, 1902.

D. C. RIPLEY.

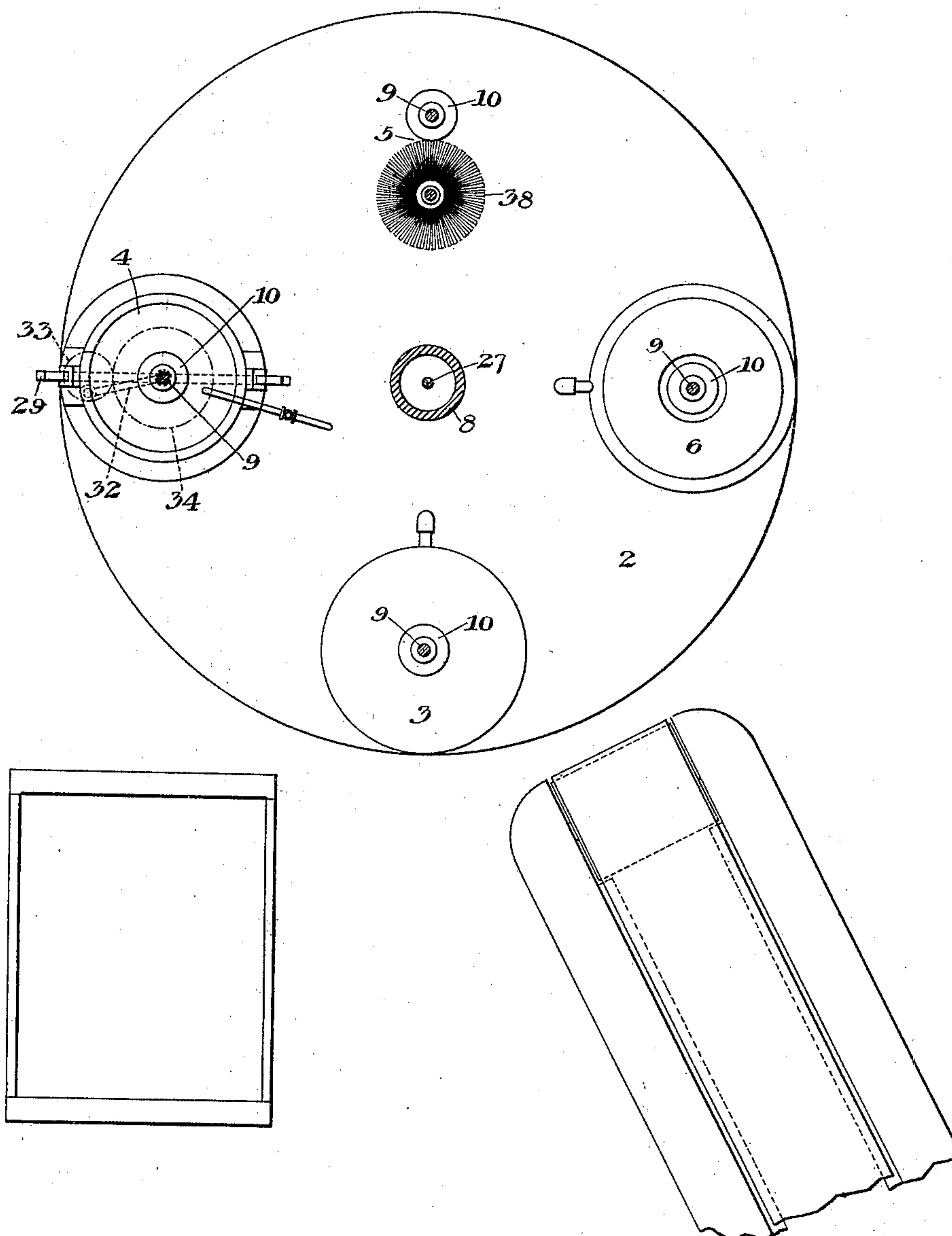
APPARATUS FOR THE MANUFACTURE OF GLASSWARE.

(Application filed Nov. 13, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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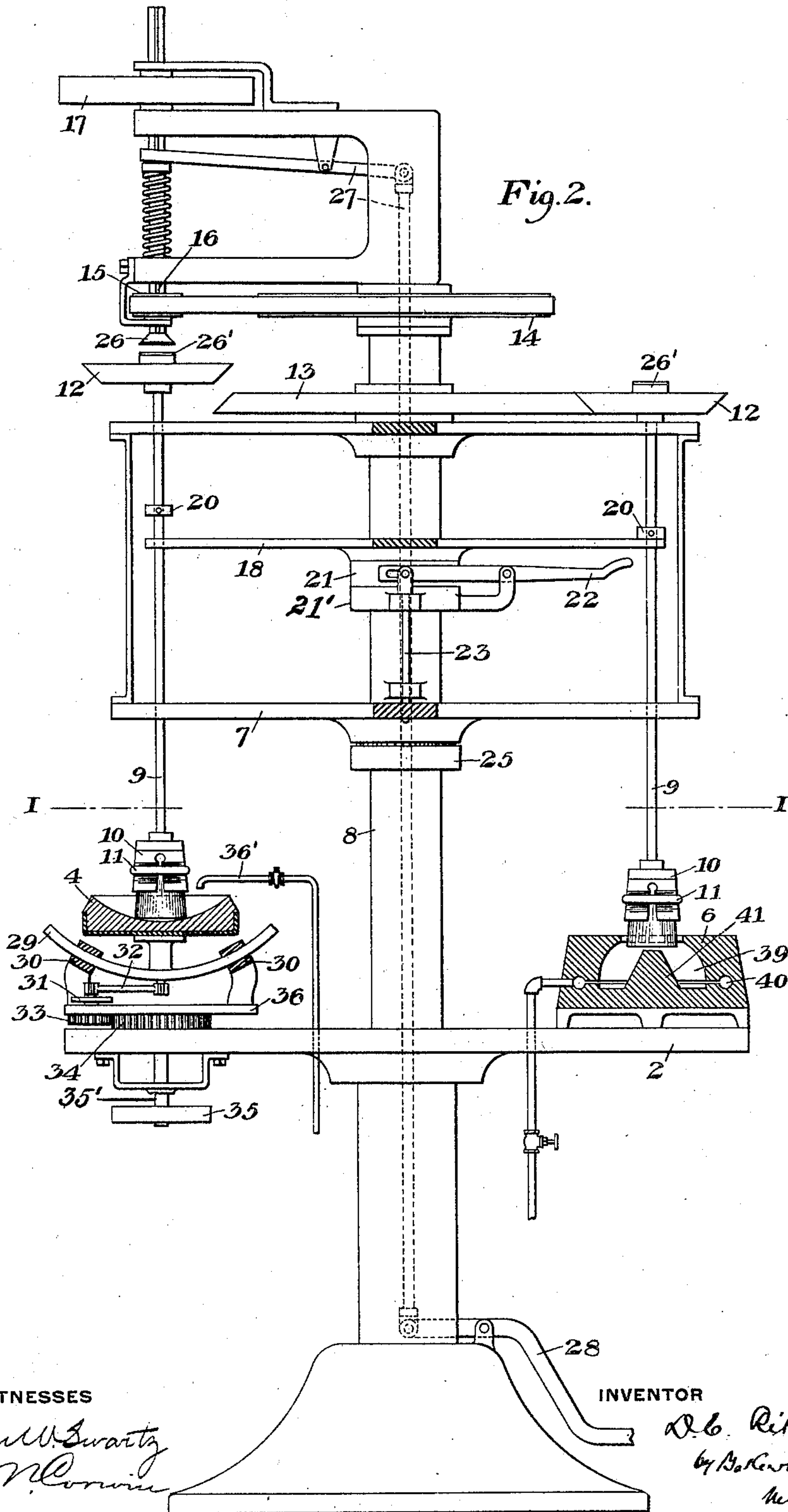
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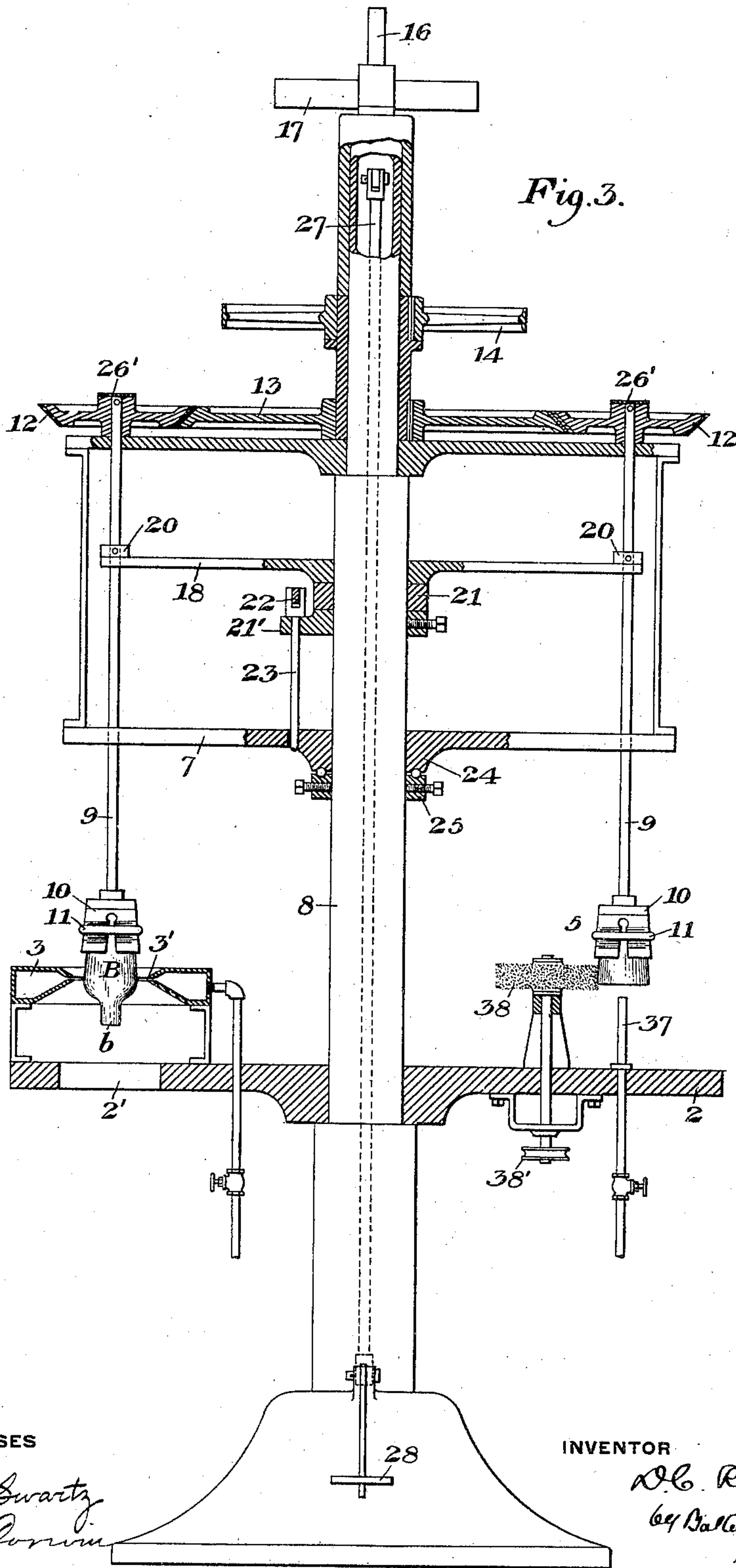
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR THE MANUFACTURE OF GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 709,797, dated September 23, 1902.

Application filed November 13, 1901. Serial No. 82,108. (No model.)

To all whom it may concern:

Be it known that I, DANIEL C. RIPLEY, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Improvement
5 in Apparatus for the Manufacture of 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—

10 Figure 1 is a horizontal section on the line I I of Fig. 2. Fig. 2 is a side elevation, partly in section; and Fig. 3 is a cross-section taken at right angles to Fig. 2.

The object of my invention is to provide
15 means by which the finishing operation can be performed upon blown-glass articles rapidly and cheaply with less labor than has been possible heretofore.

In the drawings, 2 represents a table where-
20 on are mounted at successive points a cracking-off device 3, a grinding-stone 4, a drying device 5, and a finishing, preferably fire-finishing, device 6, at which the articles to be finished are successively cracked off, then
25 ground at the edges, then cleaned and dried, and finally fire-finished before they are removed from the table in which they are carried. Above the table 2 is a carrier 7, consisting of a frame revolubly mounted on a
30 vertical post 8, which extends upwardly from the center of the table. This frame carries a number of spindles 9, at the lower ends of which are chucks 10, in which the glass articles to be treated are held. These chucks
35 may conveniently be formed of sockets having slotted compressible sides fitted with rings 11, mounted with screw-threads on the chucks, so that by turning the rings the chucks may be compressed slightly to grip the glass arti-
40 cles placed therein. Other suitable forms of chuck may be substituted. At the upper end of each of the spindles 9 is a friction-wheel 12, adapted to engage with a central friction-wheel 13, the hub of which is connected to a
45 pulley-wheel 14, driven by a suitable power connection from a pulley 15, slidably mounted on a shaft 16, driven by a pulley 17. The spindles 9 are vertically movable by means of a vertically-movable frame 18, mounted on
50 the standard 8 and having arms which fit

around the spindles and are adapted to en-
gage collars 20 thereon. Under the frame 18, mounted on the standard 8, is a collar 21, con-
nected with a lever 22, and by operating this lever the collar will be raised, elevating there- 55
by the frame 18, which can rotate freely on the collar. Connected with the lever 22 is a locking-rod 23, which passes through a fixed collar 21' on the post 8 and is adapted to en-
60 ter sockets in the frame 7, and when the lever is in its normal position (shown in Fig. 3) the rod will lock the frame and hold it from turning, and when the lever is depressed the spindles will be lifted and the frame 7 simul-
65 taneously unlocked and enabled to be rotated around the standard. I may mount the central hub 24 of the frame upon ball-bearings on a collar 25 to facilitate its turning motion.

To drive the spindles 9 when they come di-
rectly above the grinding-stone 4, I prefer to 70
employ a vertically-movable friction-clutch 26, which is adapted to be moved into contact with a corresponding clutch member 26' on the top of each friction-wheel 12. Such
75 movement may be effected by a lever 27, operated by a foot-lever 28, which is connected with the lever by a rod extending vertically through the post 8. This lever bears against a collar on the shaft 16, and the shaft is an-
80 gular or is provided with a key and fits in correspondingly-shaped holes in the centers of the pulleys 15 and 17, so that when the clutch 26 is moved down into contact with the clutch member 26' the shaft will drive the
85 spindle 9.

The cracking-off device on the table 2 com-
prises, preferably, an annular gas-burner 3, having a slotted inwardly-directed gas-open-
ing 3', adapted to deliver an annular jet of
90 flame upon the circumference of the blown-glass article when the latter is lowered into the central opening of the burner. Below this central opening is a hole 2', through which the cracked-off portion *b* of the glass article
95 can drop.

The grinding device comprises a stone 4
with a curved grinding-face mounted on a
rocker 29, which moves in suitable bearings
30. This rocker is adapted to be rocked back
and forth and is also rotatory on a vertical 100

axis. The rocking motion may be effected by a crank-wheel 31, connected to the support 29 by a pitman 32 and driven by a planetary gear-wheel 33, carried by a frame 36, on which the bearings 30 are mounted. The gear-wheel 33 meshes with a central pinion 34, which is fixed to the table 2, and the frame 36 is mounted on and rotated by a shaft 35', carrying a driving-pulley 35 and passing through the table 2. As the frame 36 carries in its rotation the gear-wheel 33 the latter will revolve and will impart a back-and-forth oscillation to the grinding-stone, while the grinding-stone itself is revolved on a vertical axis by the rotation of the frame 36. The advantage of thus rocking the stone is that it continually presents a fresh grinding-surface to the article to be ground, and is thus prevented from wearing away in irregular grooves or lines, as would otherwise be the case. The curvature of the surface of the stone insures its contact with the edges of the article to be ground in every position of the stone. The stone is provided with a suitable water-supply pipe 36', and during the grinding operation the surface of the glass article becomes wet and its edges coated with fine dust or grit. To dry the glass quickly preliminary to its fire-finishing and to remove this dust, I provide a drying device 5, which comprises, preferably, an air-blast pipe 37, stationed directly under the position of the spindle when the latter is at the drying-station, and a brush 38, adapted to make contact with the edge of the glass and to be rotated by a driving-pulley 38'. When at the drying-station, the glass article is rotated by revolution of the spindle, the brush rotates in contact with its edge, and the air-blast is directed into its interior. The air is preferably heated, and its action is to dry out and clean very quickly the surface of the glass article.

The fire-finishing device 6 comprises a gas-burner composed, preferably, of a refractory block having an annular combustion-chamber 39, into which an annular gas-jet 40 discharges, and a central reverberating-block 41, adapted to be heated and to be rendered incandescent by the flame. The glass article is carried by the spindle into a position directly over the block 41, and the flame from the combustion-chamber 39 impinging upon its edge while it is rotating will very quickly polish and finish it.

In working the machine the operator at or before the time the spindles are brought successively to the cracking-off station by rotation of the frame inserts into the chuck a glass article B. During the rotation of the frame 7, which is effected step by step, the frame 18 is lifted so as to raise all of the spindles above the level of the various devices on the table 2, and when the frame 7 has been rotated so as to bring the spindles over these devices the frame is lowered and the carrying-frame 7 locked. The lowering

of the spindle 9 at the cracking-off station brings the glass article within the circle of the burner. The end *b* is cracked off thereby and drops through the hole 2'. The spindles are again raised, the frame 7 turned to bring the glass articles above the grinding-wheel 4, and when the spindles are next lowered the edge of the article comes into contact with the wheel. Then by depressing the shaft 16 the spindle 9 is rotated and the glass article pressed against the stone, while the rotation of the pinion 34, as above explained, rotates the stone in contact with the glass article and rocks the stone back and forth. When the grinding operation is completed, the spindles are again raised and the frame 7 is moved another step forward, carrying the article to the wiping-station, where it is dried and wiped by the air-blast and brush. The article is then carried by rotation of the frame 7 to the fire-finishing station, where its edges are heated and fire-finished, as above explained. It may then be removed from the chuck.

It will be understood that the operations above described are successively performed on the several spindles, each of which carries a glass article, and, if desired, the number of spindles may be increased, the frame 7 being arranged to rotate at each step the fractional part of a revolution corresponding to the number of spindles employed.

The construction and shape of the cracking-off, grinding, drying, and fire-finishing devices may be varied by the skilled mechanic, and the frame or carrier by which the articles are carried to the successive stations may be varied, though the constructions which I illustrate are desirable.

I claim—

1. Apparatus for finishing blown-glass articles, comprising at successive stations a cracking-off and a finishing device, and a carrier having inverted dependent holders adapted to carry glass articles successively to said stations; substantially as described.

2. Apparatus for finishing blown-glass articles, comprising at successive stations a cracking-off, a grinding, and a fire-finishing device, and a carrying-frame having inverted dependent holders adapted to carry glass articles at their lower ends successively to said stations; substantially as described.

3. Apparatus for finishing glass articles, comprising at successive stations a cracking-off, a grinding, a drying, and a fire-finishing device, and a carrier having inverted holders by which glass articles are carried successively to said stations; substantially as described.

4. Apparatus for finishing glass articles, comprising at successive stations, a grinding and a fire-finishing device, and a carrier having inverted dependent holders adapted to carry glass articles successively to said stations; substantially as described.

5. Apparatus for finishing glass articles, comprising at successive stations, a cracking-

off, a grinding, and a fire-finishing device, and a carrier having inverted dependent holders adapted to carry glass articles successively to said stations, substantially as described.

5 6. Apparatus for finishing glassware, comprising stations at which glass articles are successively treated by devices situate thereat, of spindles carrying the glass articles, a rotary frame for the spindles, and means for raising the spindles and the glass articles above the level of the said devices; substantially as described.

15 7. A drying and wiping device for glass articles comprising an air-blast pipe, and a rotary brush, the one adapted to direct a blast of air upon the article, and the other to brush the surface of the same; substantially as described.

20 8. Apparatus for finishing blown-glass articles, comprising at successive stations, a cracking-off, a grinding, and a finishing device, and a carrier having inverted dependent holders adapted to carry glass articles successively to said stations; substantially as described.

9. Apparatus for finishing blown-glass ar-

articles, comprising at successive stations a cracking-off, a grinding, and a fire-finishing device, a chuck arranged to hold the article, and a carrier by which the chuck is carried in inverted dependent position successively to said stations; substantially as described. 30

10. Apparatus for finishing glass articles, comprising at successive stations a cracking-off, a grinding, a drying, and a fire-finishing device, a chuck arranged to hold the article, and a carrier by which the chuck is carried in inverted dependent position successively to said stations; substantially as described. 35 40

11. Apparatus for finishing glass articles comprising at successive stations a grinding and a fire-finishing device, a chuck arranged to hold the article, and a carrier by which the chuck is carried in inverted dependent position successively to said stations; substantially as described. 45

In testimony whereof I have hereunto set my hand.

DANIEL C. RIPLEY.

Witnesses:

GEO. B. BLEMING,
H. M. CORWIN.