D. CHALLINOR.

Machine for Finishing Open-Ended Glassware.

No. 202,631. Patented April 23, 1878.

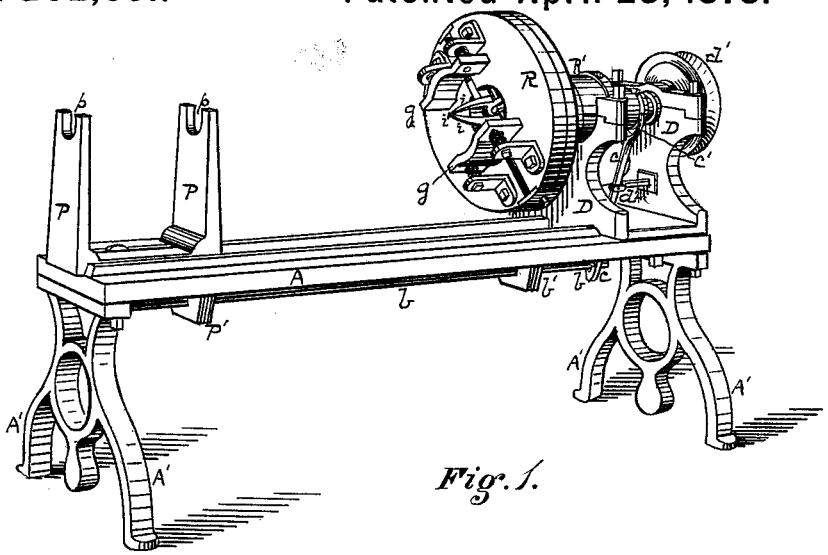

Fig. 1.

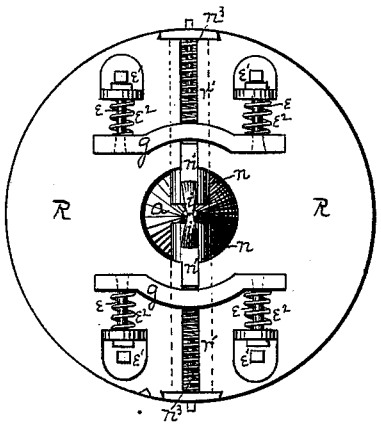

Fig. 2.

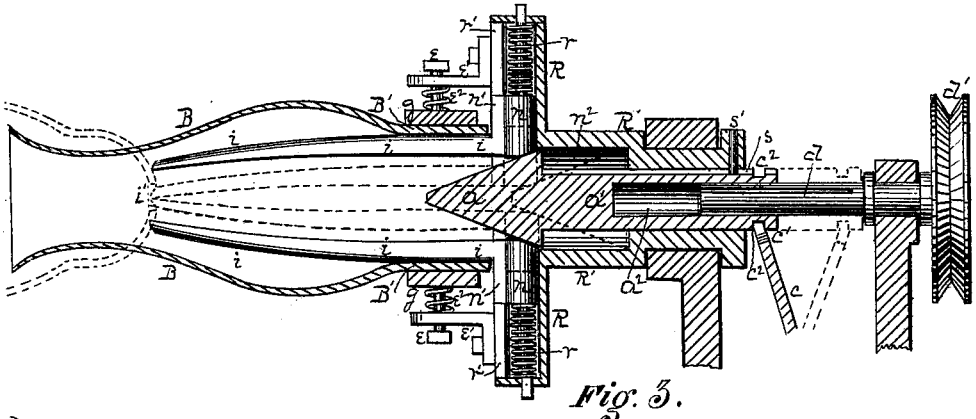

Fig. 3.

Witnesses
W. P. Hood
E. L. Parker

Inventor David Challinor,
By Attorney George H. Christy

UNITED STATES PATENT OFFICE.

DAVID CHALLINOR, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF, JOHN LOWERY, AND DAVID F. EVANS, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR FINISHING OPEN-ENDED GLASSWARE.

Specification forming part of Letters Patent No. **202,631**, dated April 23, 1878; application filed February 6, 1878.

To all whom it may concern:

Be it known that I, DAVID CHALLINOR, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Machine for Finishing Open-Ended Glassware; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of my improved machine. Fig. 2 is a face view, to an enlarged scale, of the revolving head of the machine shown in Fig. 1; and Fig. 3 is a vertical sectional view, to the same enlarged scale, of the revolving head and the devices which drive it, also illustrative of its operation in finishing the tubular base of a lamp-chimney.

In a patent granted to me January 8, 1878, No. 199,030, I described a mode of perforating the lower dome-shaped end of a blown-glass lamp-chimney.

My present improvement commences where the previous improvement left off. I now take the chimney as it thus comes from the mold, reheat the lower end, and by mechanical means, the use of which requires little or no skilled labor, I open out, shape, and finish the lower end of the chimney.

For convenience and clearness of illustration, I have shown, and will first describe, my invention as applied to the opening out, shaping, and finishing of a cylindrical base, B′, on the lower end of an ordinary lamp-chimney, B.

The legs A′ support a longitudinally-slotted table, A. In the central slot of this table, so as to work back and forth between suitable guides or ways, I arrange the bearing-posts P, which are so connected as to move together. These posts and their connections constitute a kind of carriage, some part of which projects below the table, as at P′, and to such projection I secure one end of a connecting-rod, *b*. On suitable supports D D, at the other end of the table, I mount the revolving head, which carries the opening and finishing tools, the plug, and the devices through which their rotation is effected, the revolving head having its axis in line, as nearly as may be, with the axis of the chimney B, when, while still attached to its blow-pipe, the latter is placed in the seats *p* of the posts P.

The head is made with a tubular bore, n^2, which extends along into and through its socket R′, of suitable size, shape, and proportions for the working therein of the plug *a* and its stem a^1. The stem has a longitudinal groove, *s*, into which projects the end of a pin, *s′*, so that the stem and plug may have an endwise motion, while the stem communicates its revolving motion to the socket and head. The stem a^1 is also bored out at its base end, as at a^2, and the forward end of the driving-shaft *d* works therein.

A groove-and-feather connection between the shaft *d* and the bore of the stem a^1 provides for the longitudinal motion of the stem while it is being rotated by the shaft, the rotation of the latter being secured by power transmitted through a band-wheel, *d′*, or other suitable gear.

Forward and backward endwise movement is given to the plug *a* and stem a^1 by means of a fork, c^1, on the end of a lever, *c*. The fork engages a groove, c^2. The lever is fulcrumed at d^2, and its opposite end is pivoted to the end of the connecting-rod *b*, the latter being held, if necessary, in the proper line of motion by a guide, *b′*.

From opposite points in the periphery of the head R, I bore the radial boxes *r r*, and cut slits *r′* down the front of the boxes.

A stem, *n*, is fitted to each box *r*, and a wing, n^1, on the front side thereof, plays in each slit *r′*. Each stem *n* also carries the one-half of the opening and inside finishing and shaping tools *i i*. These tools, when closed together, as in Fig. 1, come to a point, *i′*, at their outer ends, such as will readily enter the perforation in the base of the blown chimney, as represented by dotted lines in Fig. 3. From the point they enlarge or taper outwardly, somewhat as is usual in similar hand-tools, and in other respects they have exterior operative surfaces, such as are common in hand-tools of that class.

Springs n^3 are arranged in the boxes on suitable guiding-stems, to press the stems and tools toward each other and toward the axial line of the machine. These central tools are forced apart at the proper intervals by means of the conical plug *a*, the tapering face of which operates against the bases of the stems.

At proper points on the front face of the head R, with reference to finishing the exterior of the base B′ of the chimney, I arrange the exterior rubbers *g*, each having, by preference, a rubbing-face conformed closely or approximately to the curvature of the finished base of the chimney. These may be fixed in position; but, on account of the slight irregularities of thickness of glass which usually follow the blowing operation, I prefer to attach them so that they may yield slightly or be self-adjusting. One convenient way of doing this is by posts *e*, clips e^1, and springs e^2; but other modes of mounting the rubbers may be adopted. These rubbers constitute mechanically an exterior finishing-tool, and may be so designated.

In operation the head is caused to revolve with some considerable rapidity. The blow-pipe, to which the blown chimney remains attached, is placed in the rests *p*, and in such a position as to present the perforation of the base to the points *i′* of the inside finishing-tools *i i*. The operator then pushes the carriage P P slowly, but steadily, toward the revolving head. This causes the hole in the base of the chimney to pass into the tools *i*, and also causes the plug *a* to advance and force the tools *i* rapidly outward. This motion is continued till the operation is complete, the position of the devices and their relationship to the chimney during the finishing stage of the operation being substantially as represented in Fig. 3. The carriage P P is then drawn back or caused to go back by a spring, the chimney is removed, and the devices come back to the proper position for a repetition of the work.

The improvement described is equally applicable to opening, shaping, and finishing the base of blown lamp-chimneys, whatever mode of making a hole therein may be employed; and by the proper changes in the shape of the inside shaping and finishing tools, and of the operative faces of the exterior rubbers, other shapes of chimney-bases may be shaped and finished in the same way; and, as I believe in side-expanding tools, when combined on a revolving head with exterior rubbers, to be new, I claim such combination for finishing the open cylindrical ends of articles of hollow glassware generally, whether blown or pressed.

Various modifications of form and construction may be made in the devices referred to; but all such as involve a like operation are included within the scope of the present invention.

A three or four pronged instead of a two-pronged interior expanding-tool may be employed in connection with three or four rubbers arranged in the corresponding radial lines, if so preferred, though, for most purposes, two of each will be enough.

A clamping device of any suitable construction may also be added to clamp or steady the blow-pipe in the rests *p*. If, for any reason, the use of a snap for presenting the glass article to the finishing-tools is preferred, such device may be manipulated in like manner as the blow-pipe, and, in the operation described, will be merely the mechanical equivalent thereof.

While I have described the chimney or other article as not rotating during the operation described, it will be within my invention to mount it in a suitable snap or frame capable of rotation, and rotate it in one direction while the head R, with the devices appertaining thereto, are operated in the other direction; or the article may be rotated and the head be non-rotary.

When desired that the chimney should have a short range of motion before engaging the opening-tool, provision may be made therefor by a mechanic skilled in the art by so gearing the carriage that it may move the desired distance before it engages the connecting-rod *b*, or by causing the rod *b* and carriage to be connected, at the pleasure of the workman, by the use of a treadle, shifting-lever, or other like means.

It will also lessen loss by friction somewhat if the band-wheel be arranged on the socket R′, or on an extension of the same, the revolution of the plug not being necessary, and such and other like modifications are hereby included herein.

I claim herein as my invention—

1. The combination of exterior finishing-tool, interior expansible opening and finishing tool, and a longitudinally-moving tapering-plug, substantially as set forth.

2. The combination of interior tool *i i*, attached to stems *n n*, bored and boxed head R, springs n^3, exterior tool *g*, plug *a*, and stem a^1, substantially as described.

3. The combination of carriage P P, connecting-rod *b*, lever *c*, driving-shaft, plug and stem, revolving head, and interior and exterior finishing-tools, substantially as set forth.

4. A device for opening the perforated end of articles of glassware, consisting of tools *i i*, movable toward and from each other inside the article of glassware, and tapering-plug *a*, combined with suitable mechanism for giving the plug a forward-and-backward motion, substantially as set forth.

In testimony whereof I have hereunto set my hand.

DAVID CHALLINOR.

Witnesses:
J. J. McCORMICK,
CLAUDIUS L. PARKER.