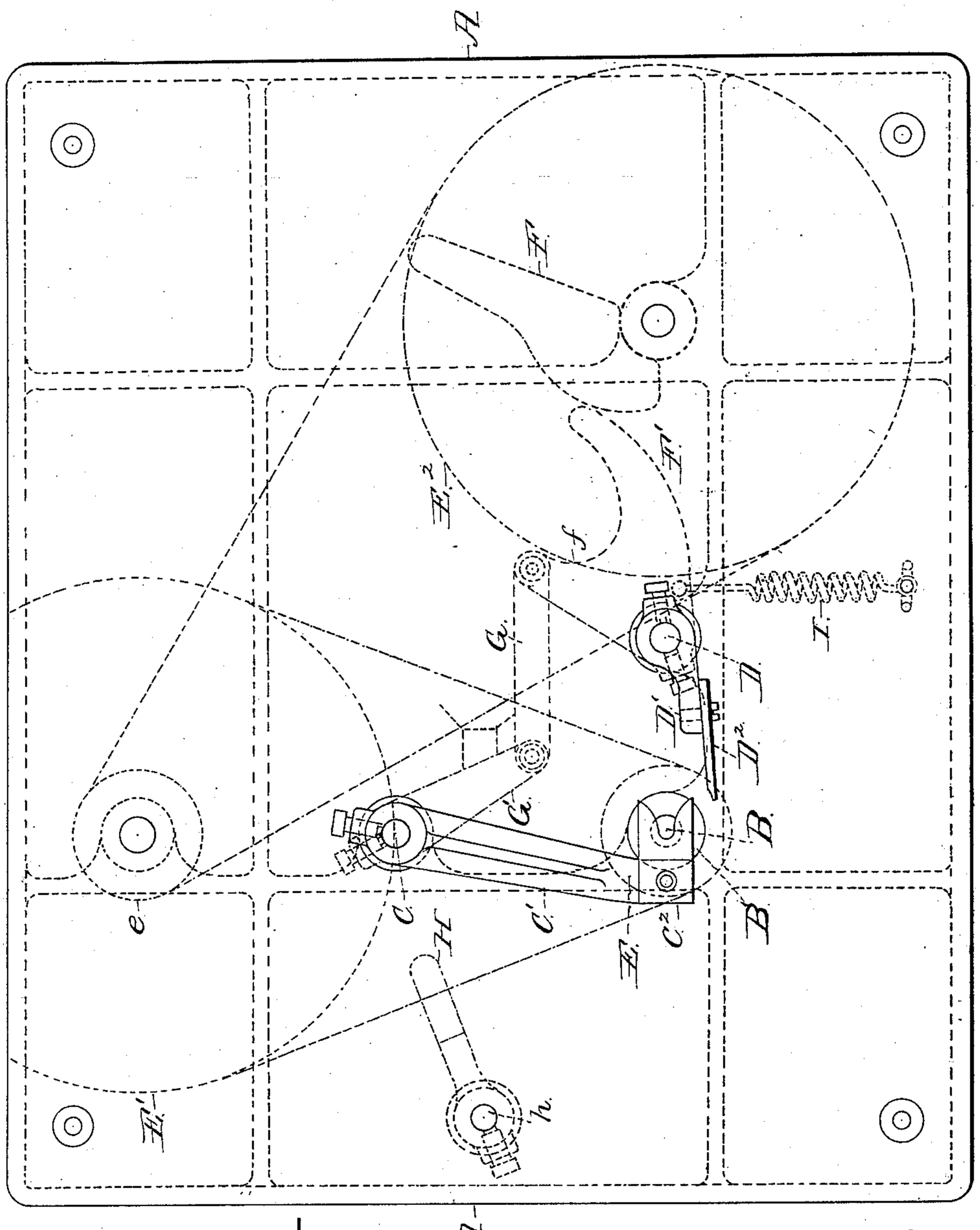
(No Model.) 3 Sheets—Sheet 1.

J. E. BLACKBURN & W. I. MANN.

MACHINE FOR FINISHING ARTICLES OF GLASSWARE.

No. 363,580. Patented May 24, 1887.



Witnesses:
Harris A. Clark
Jno. C. Schroeder.

Inventors:
Joseph E. Blackburn
William I. Mann
by Geo. W. Dyer Attorney

(No Model.) 3 Sheets—Sheet 2.

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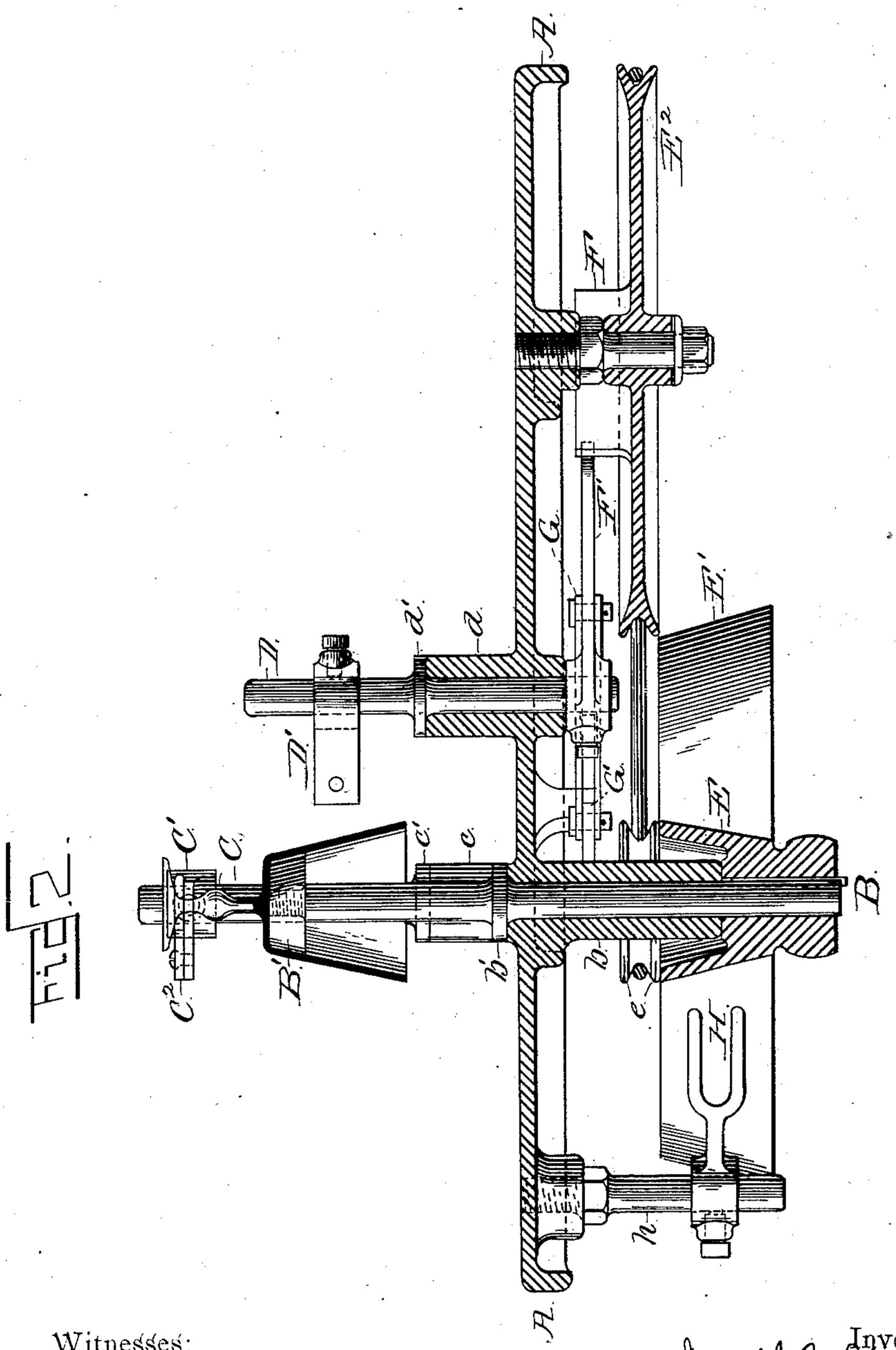

FIG. 2.

Witnesses:
Morris A. Clark.
Jno. C. Schroeder.

Inventors:
Joseph E. Blackburn
William I. Mann
by Geo. Cushing
Attorney:

(No Model.) 3 Sheets—Sheet 3.

J. E. BLACKBURN & W. I. MANN.

MACHINE FOR FINISHING ARTICLES OF GLASSWARE.

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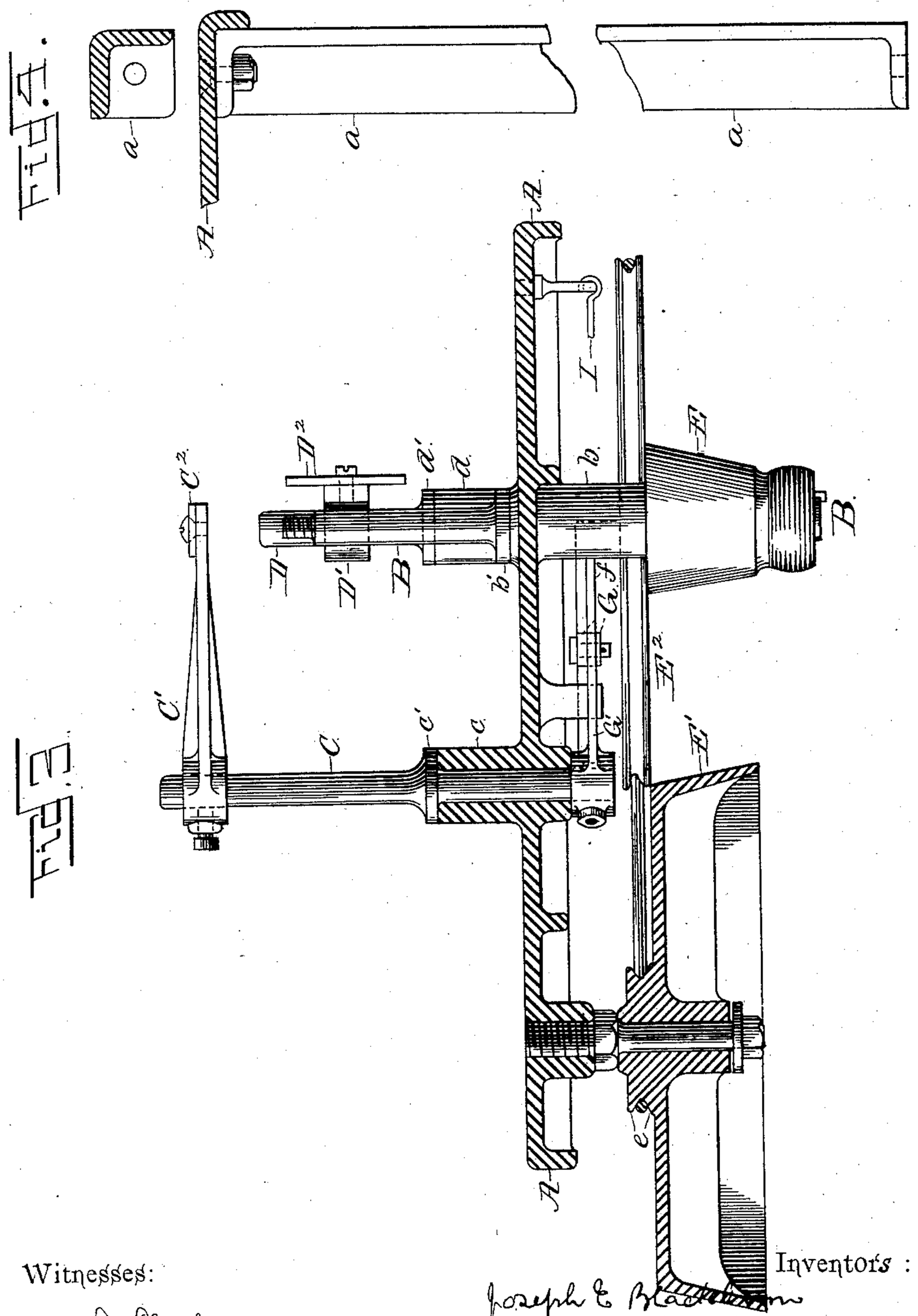
Fig. 1.



Witnesses:

Norris A. Clark

Jno. C. Schroeder.

Inventors:

Joseph E. Blackburn

William I. Mann

by Geo. Cowper

Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH E. BLACKBURN, OF WHEELING, AND WILLIAM I. MANN, OF BENWOOD, WEST VIRGINIA.

MACHINE FOR FINISHING ARTICLES OF GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 363,580, dated May 24, 1887.

Application filed February 23, 1886. Serial No. 192,928. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH E. BLACKBURN, of Wheeling, in the county of Ohio and State of West Virginia, and WILLIAM I. MANN, of Benwood, in the county of Marshall and State of West Virginia, have invented a new and useful Improvement in Machines for Finishing Articles of Glassware; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Nearly all articles of pressed glassware, particularly such as have a stem and foot, after being removed from the mold and reheated for the purpose of polishing and finishing, frequently become so hot and pliable as to lose their shape unless provision is made to prevent it. This has heretofore been provided against by rolling the article over and over upon a smooth surface, and at the same time the article has been polished and otherwise completed by proper manipulations with a hand-tool.

Our object is to provide a machine for polishing and finishing the article, and at the same time one which will prevent its loss of shape from an excessive application of heat. These objects are very successfully accomplished by our present machine, which embraces a rotating former for holding the article to be finished, an automatically-vibrating hook or guide, which fits partly around the stem of the article and keeps it straight or straightens it if crooked, and an automatically-vibrating buffer-holder carrying an adjustable buffer or finishing and polishing tool, the said buffer-holder and the hook or guide operating simultaneously and at regular intervals in this way—that when one article is finished they both open or break contact with the same and allow it to be removed and another to be replaced before they again close in upon the former. In these several devices, together with their details of construction and arrangement, lies the novelty of our invention, for a more thorough understanding of which attention is invited to the accompanying drawings, in which—

Figure 1 is a plan view of the machine with various parts in dotted lines; Fig. 2, a vertical longitudinal section of the same on the line *x x* of Fig. 1, with several of the parts shown in full; Fig. 3, a vertical transverse section on the line *y y*, with several of the parts shown in full; and Fig. 4, a detail showing a portion of the table and the way it is supported.

Like letters of reference denote corresponding parts in the several views.

A denotes a table, supported at its corners by suitable legs or standards, *a*, preferably of angular form, and secured to the table by bolts or rivets, as shown in Fig. 4.

B is the vertical main or driving shaft, which passes through a tubular extension, *b*, of the table, and has a flange or collar, *b'*, near its center, which sets upon the upper end of said extension *b* and maintains the shaft in proper position. A "former," B', is screwed on the upper end of this shaft, so as to be removable to allow others of various sizes to be employed, and said former is used to hold the article while it is being polished and finished up.

The former should fit the interior of the article closely enough to turn it rapidly; but even if it fails to fit in this way its centrifugal force will be sufficient to throw the sides of the article out against the buffer or polishing and finishing tool, presently to be described. Furthermore, the former may be of any size and shape suitable to accommodate the article to be worked on, and in Fig. 2 is shown as holding a glass goblet with its stem pointing upward, and in this position all articles are to be placed over the former.

In a straight line back of the shaft B, which carries the former, is another shaft, C, which passes vertically through a tubular extension, *c*, of the table, and has a flange or collar, *c'*, which sets upon the upper end of said extension and maintains the position of said shaft like as before described with relation to shaft B. This shaft C carries near its upper end a vertically-adjustable arm, C', adapted to be adjusted and secured by means of a suitable set-screw. This arm extends out laterally from its shaft, and its outer or free end is cast or otherwise provided with a hook or guide, C^2, which may be adjustable upon the arm, and is slotted to receive and fit partly around the

stem of the article below its foot, so as to hold the same steady and straight or straighten it if crooked.

Immediately to the right of the main or driving shaft B, and in a straight line therewith, is another shaft, D, which passes through a tubular extension, *d*, of the table, and has a flange or collar, *d'*, which sets upon the upper end of said extension, as and for the purpose described with relation to the other shafts, B and C. This shaft D carries near its upper end a vertically-adjustable buffer-holder, D', adjusted and secured by means of a suitable set-screw. Aside from the vertical adjustment, this buffer-holder D', as well as the arm C' on the shaft C, previously described, may be capable of adjustment around their respective shafts, to accommodate large and small sized articles. This buffer-holder, like the arm C', extends out laterally from its shaft toward the former B', and is provided with a "buffer" or polishing and finishing tool, D^2, adjustable longitudinally by means of a slot and set-screw.

To the lower end of the main or driving shaft B is keyed a small cone-pulley, E, which, by means of a proper belt-connection, drives a large cone-wheel, E', arranged horizontally under the table A and supported by a shaft screwed into a socket of the table at a point in the rear of the shaft C and central therewith. This cone-wheel E' holds a position reverse to that of the driving cone-pulley E, and has at its center, on the upper side, a small grooved pulley, *e*, which by proper belt-connections transmits motion to the large grooved wheel E^2, that is arranged horizontally under the table to the right of the shaft D, and is supported by a shaft screwed into a socket of the table at a point on a line straight and central with the shafts B and D. The upper face of this wheel E^2 has a finger-shaped cam, F, which extends out laterally from the hub to the rim, and in every revolution of the wheel E^2 makes contact with another cam, F', made rigid with the shaft D of the buffer-holder below the table A by means of a suitable set-screw. This cam F' has an arm or extension, *f*, which is pivoted at its outer end between the outer ends of a double lever, G, in turn jointed loosely to a lever, G', which is made rigid with the shaft C below the table A by means of a suitable set-screw.

H is a vertically and annularly adjustable fork mounted on a vertical shaft, *h*, screwed into a socket on the under side of the table at a point near one end of the latter and about midway between its side edges, as shown in Fig. 1. This fork is provided to hold the belt in proper position upon the driving-pulley E and wheel E'.

The large wheel E' is simply a "reducer," as the main shaft B must revolve quite fast, while the wheel E^2, which serves to operate the hook or guide C' and buffer-holder D', should revolve very slowly.

The reducer E' and the driving-pulley E are made conical, in order to change the ratio of speed between the main shaft B and the wheel E^2, for in working small ware the latter should not run so slowly nor the shaft B so fast as when working large ware.

The operation of the machine is as follows: The driving-pulley E takes power from any suitably-arranged counter-shaft, and motion is transmitted to the wheel E', and from thence to the wheel E^2. On the engagement of the cams F and F' the shaft D is turned so that the buffer D^2 is released from contact with the sides of the article, and at the same time, through the medium of the levers G and G', the shaft C is turned so as to release the hook or guide C^2 from the stem of the article, and thus it is that both the buffer and the hook or guide open outward simultaneously and allow the finished article to be removed from the former and another article substituted in its place. When the cams disengage themselves, the hook or guide and the buffer close in upon the newly-mounted article through the medium of a spiral spring, I, attached to the cam F' and to the table A at suitable points. The operations of these devices take place at regular intervals during the revolution of the wheel E^2.

The advantage asserted for our improved machine is that it will do the work of polishing and finishing more satisfactory and in less than half the time and with half the labor and expense heretofore required for such work.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft, mechanism for turning said shaft in one direction, and a former screwed on the upper end of said shaft so as to be removable, substantially as set forth.

2. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft carrying a former for holding the article, and another vertical shaft carrying an arm provided with a stationary hook or guide adapted to fit the stem of the article, substantially as and for the purposes set forth.

3. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft carrying a former for holding the article, and another vertical shaft carrying a vertically-adjustable arm provided with an adjustable hook or guide adapted to fit the stem of the article, substantially as and for the purposes set forth.

4. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft carrying a former for holding the article, and another vertical shaft carrying a vertically-adjustable arm provided with an adjustable buffer or finishing-tool, substantially as and for the purposes set forth.

5. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft carrying a former for holding the article, another vertical shaft carrying an

arm provided with a hook or guide for steadying and straightening the article, and another vertical shaft carrying a buffer-holder provided with the buffer or finishing-tool, substantially as described.

6. In a machine for finishing glassware, the combination of a supporting-frame, a vertical driving-shaft carrying a former, another vertical shaft carrying a hook or guide, another vertical shaft carrying a polishing and finishing tool, and intermediate gearing and connections between said shafts for simultaneously throwing said guide and tool into and out of contact with the article, substantially as and for the purposes set forth.

7. In combination, the vertical driving-shaft B, carrying the former, the vertical shaft D, carrying the buffer, the cam F', secured to said shaft D, the wheel E^2, carrying the cam F, and suitable gearing for driving said wheel, substantially as and for the purposes set forth.

8. In combination, the vertical driving-shaft B, carrying the former, the vertical shaft D, carrying the buffer, the cam F', secured to said shaft D, the spring I, attached to said cam, the wheel E^2, carrying the cam F, and suitable gearing for driving said wheel, substantially as and for the purposes described.

9. In combination, the vertical driving-shaft B, carrying the former, the vertical shaft C, carrying the hook or guide, the vertical shaft D, carrying the buffer, the cam F', secured to said shaft D, the two arms of levers G and G', connecting said cam and the shaft C, the wheel E^2, carrying the cam F, and suitable gearing for driving said wheel, substantially as and for the purposes set forth.

10. In combination, the vertical driving-shaft B, carrying the former, the vertical shaft C, carrying the hook or guide, the vertical shaft D, carrying the buffer, the cam F', secured to said shaft D, the spring I, attached to said cam, the two arms or levers G and G', connecting said cam and the shaft C, the wheel E^2, carrying the cam F, and suitable gearing for driving said wheel, substantially as and for the purposes set forth.

11. In combination, the vertical driving-shaft B, carrying the former B' and the conical driving-pulley E, the vertical shaft C, carrying the hook or guide C^2, the vertical shaft D, carrying the buffer D^2 and the cam F, the two arms or levers G and G', connecting said cam and the shaft C, the wheel E^2, carrying the cam F, and the inverted cone-pulley E', having belt-connections with said wheel E^2 and with the driving-pulley E, substantially as and for the purposes set forth.

12. The machine for finishing glassware, comprising the table or frame A, the vertical driving-shaft B, carrying the former B' and the cone-pulley E, the vertical shaft C, carrying the arm C', provided with the hook or guide C^2, the vertical shaft D, carrying the buffer-holder D', provided with the tool D^2, the cam F, secured to said shaft D, the spring I, attached to said cam and the table, the two arms or levers G and G', connecting said cam and the shaft C, the wheel E^2, provided with the cam F, the inverted cone-pulley E', having belt-connections with said wheel E^2 and the cone-pulley E, and the fork or guide H, all combined and arranged substantially as and for the purposes set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH E. BLACKBURN.
WILLIAM I. MANN.

Witnesses:
FRANK M. JILTON,
HENRY F. LINDEMAN.