No. 810,464. PATENTED JAN. 23, 1906.

F. H. BLACKBURN.

MACHINE FOR MAKING AIR HOLE GLASSWARE.

APPLICATION FILED MAR. 2, 1905.

Fig. 1.

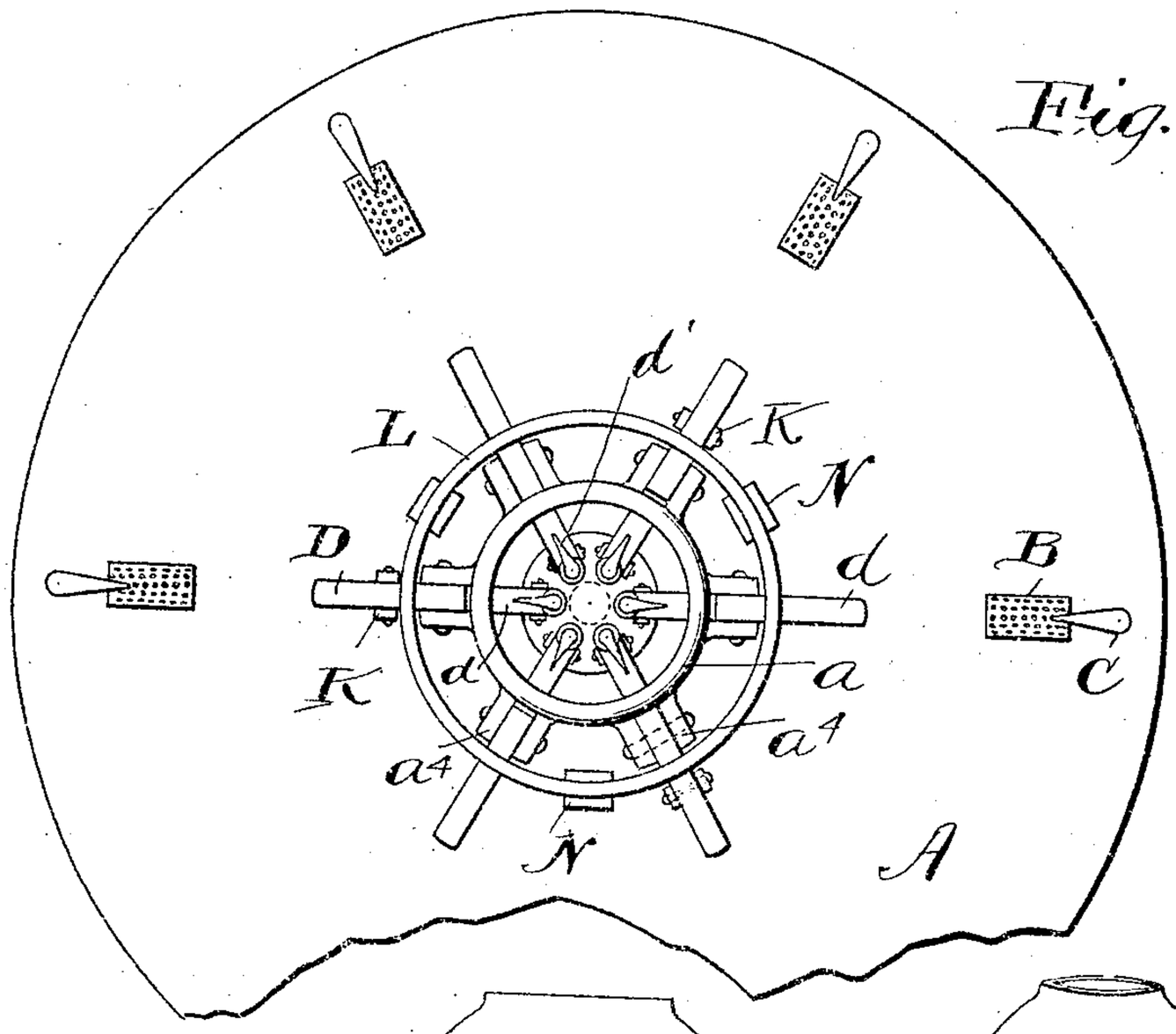
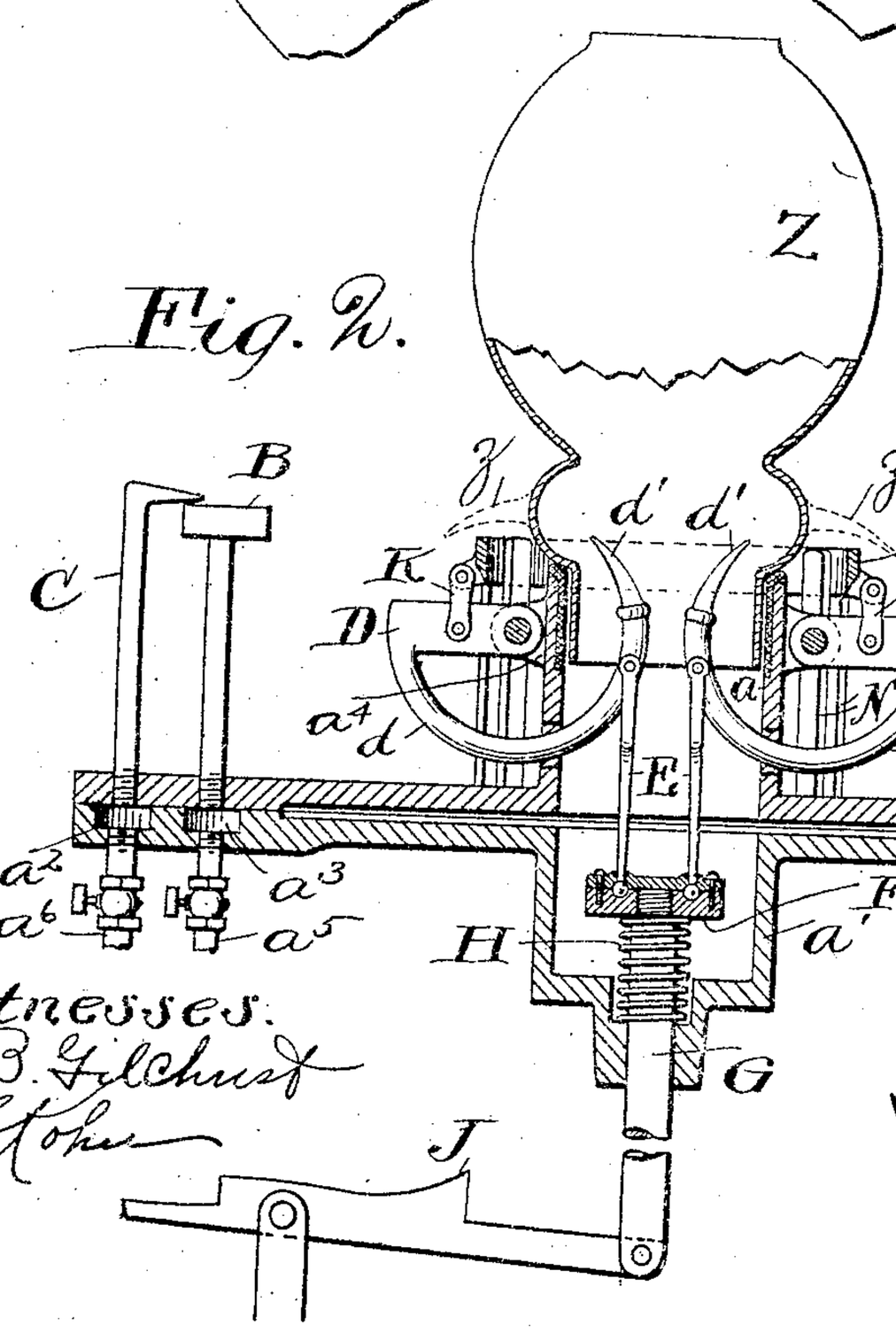


Fig. 2.



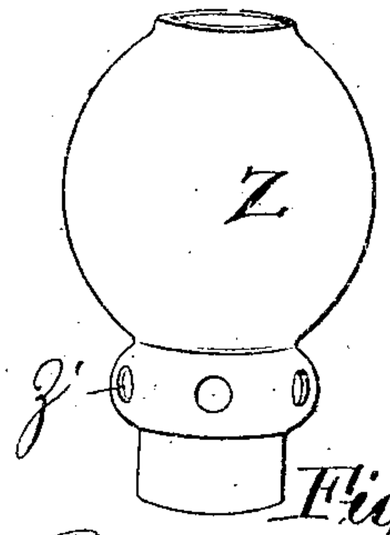


Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

FRANK H. BLACKBURN, OF FOSTORIA, OHIO, ASSIGNOR TO THE NATIONAL ELECTRIC LAMP COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

MACHINE FOR MAKING AIR-HOLE GLASSWARE.

No. 810,464. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed March 2, 1905. Serial No. 248,021.

To all whom it may concern:

Be it known that I, FRANK H. BLACKBURN, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented a certain new and useful Improvement in Machines for Making Air-Hole Glassware, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a simple and efficient machine for making holes in air-hole glassware. Such glassware is much used in incandescent gas-lighting and comprises a suitably-shaped globe having around it a circumferential row of holes.

My invention may be best summarized as consisting of the means employed for making the holes, as hereinafter more fully explained and as definitely set out in the claims.

In the drawings, Figure 1 is a plan of the machine. Fig. 2 is a vertical central section through the same, and Fig. 3 is a perspective view of the completed glassware.

Referring to parts by letters, A represents a disk from the center of which rises a tubular standard *a*. The disk A is carried by a disk A′, supported by a central standard *a*′. These parts and their supporting members constitute the frame of the machine. The upper end of the standard *a* is adapted to receive within it the lower end of the glassware, (indicated by Z.) Carried by the frame at equidistant points about the axis of the glassware are heaters each composed of the gas-burner B and the air-nozzle C. These nozzles point across the gas-burner radially toward the glassware and are adapted to project an intense flame against the glassware at the spots where the holes are to be. The heaters are carried by the disk A and receive their supply of fluid from annular passage-ways a^2 and a^3, which are shown as made in the disk A′. By having the disks made separate these passage-ways may be simple grooves in one of the disks. The other disk makes a tight connection across the same. The grooves receive their supply from an air-pipe a^6 and a gas-pipe a^5.

On the outer side of the standard *a* are a series of ears a^4, located radially, and pivoted to these ears are rocking members D, which have arc-shaped arms *d* projecting through openings into the standard. The points *d*′ of these arms normally project upward, but are far enough within the wall of the standard to allow the glassware to be conveniently put in the place over them. There are as many of these members D, equally spaced about the standard, as there are holes to be made in the glassware—six in the embodiment shown. Each member D is connected by a link E with a central head F, which is mounted on the upper end of a rod G, suitably operated by a treadle J.

When the various spots where the holes are to be are being heated, the parts are in the position shown in Fig. 2. Then the outer end of the treadle J is depressed, raising the rod G, which, through the links E, swings upward and outward the points *d*′ of the members D. These points pressing against the heated spots and passing through them poke outward horns of thin glass, as indicated by dotted lines at *z*. By making the rocking members of brass they do not adhere to the glass. A reverse movement of the treadle draws down the rod G and withdraws the points *d*′ from the horns they have produced. When the parts come into the normal position, (shown in Fig. 2,) a yielding stop is provided by means of the spring H, which the head F engages. Thereafter a depression of the inner end of the treadle draws the head farther downward and swings upward the outer ends of the members D. These outer ends are connected by links K with a ring L, which stands beneath the horns, which have been produced. This ring is guided in a vertical path by the guides N. The final downward movement of the inner end of the treadle elevates this ring sufficiently to cause it to impinge the horns and break them off. The breakage takes place close to the wall of the glassware, where the horn is thinnest. Releasing the pressure on the treadle allows the spring H to return the parts to normal position, whereupon the glassware Z is removed and another globe put in its place. The globe removed now has the holes *z*′ through it, as desired, and it only remains to grind them and glaze them to complete the glassware.

I claim—

1. In a machine for making air-hole glassware, the combination of means for holding the glassware, means for heating the same in

a plurality of separated spots, and means for forcing such heated spots away from the adjacent surface of the glassware to make a horn which may be easily broken off to leave a hole.

2. In a machine for making air-hole glassware, the combination of means for holding the glassware, means for heating the same in a plurality of spots, mechanisms for engaging such heated spots on their inner sides and adapted to move outwardly to shove the spots outward in the form of horns, and means for simultaneously operating such mechanisms.

3. In a machine for making air-hole glassware, the combination of a series of movable members shaped to extend into the glassware, and common operating mechanism for moving said members outwardly to engage the glassware and press out horns thereon.

4. In a machine for making air-hole glassware, the combination of a standard adapted to hold the glassware, a series of rocking members projecting upwardly within the standard, means for heating the glassware, and means for rocking said members to cause their ends to engage the glassware and force out horns thereon.

5. In a machine for making air-hole glassware, the combination of a tubular standard adapted to receive at its upper end the glassware to be treated, a series of rocking members pivoted on the outer side of said standard and having arcual arms extended into the interior of the standard and adapted to point upwardly, mechanism for heating spots on the glassware which are in the path of said arms, and mechanism for rocking said arms to engage and force outwardly said spots.

6. In a machine for making air-hole glassware, in combination, a support for the glassware, a series of heaters arranged about the same and adapted to project flames against it, a series of rocking members having arcual arms, said members being pivotally carried about the support and normally having their arms projecting upwardly within it, and mechanism for rocking said members on their pivots to cause the points of their arms to engage the heated spots on the glassware and force the same outwardly to make horns thereon.

7. In a machine for making air-hole glassware, the combination of a series of movable members, mechanism for moving said members to engage the glassware and press horns thereon, and mechanism for engaging said horns to break them off.

8. In a machine for making air-hole glassware, the combination of a series of rocking members, means for heating the glassware, means for rocking said members to cause their ends to engage the inner surface of the glassware and force out horns thereon, and correlatively-timed means for breaking off the horns.

9. In a machine for making air-hole glassware, the combination of a support for the glassware, a series of heaters arranged about the same and adapted to project flames against it, a series of pivoted rocking members having arcual arms, mechanism for rocking said members on their pivots to cause the points of their arms to engage the inner side of the heated spots on the glassware and force the same outwardly to make horns thereon, and mechanism operated on the return movement of said members to engage and break off said horns.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

FRANK H. BLACKBURN.

Witnesses:

MARY F. ROBINSON,

ETHEL STAHL.