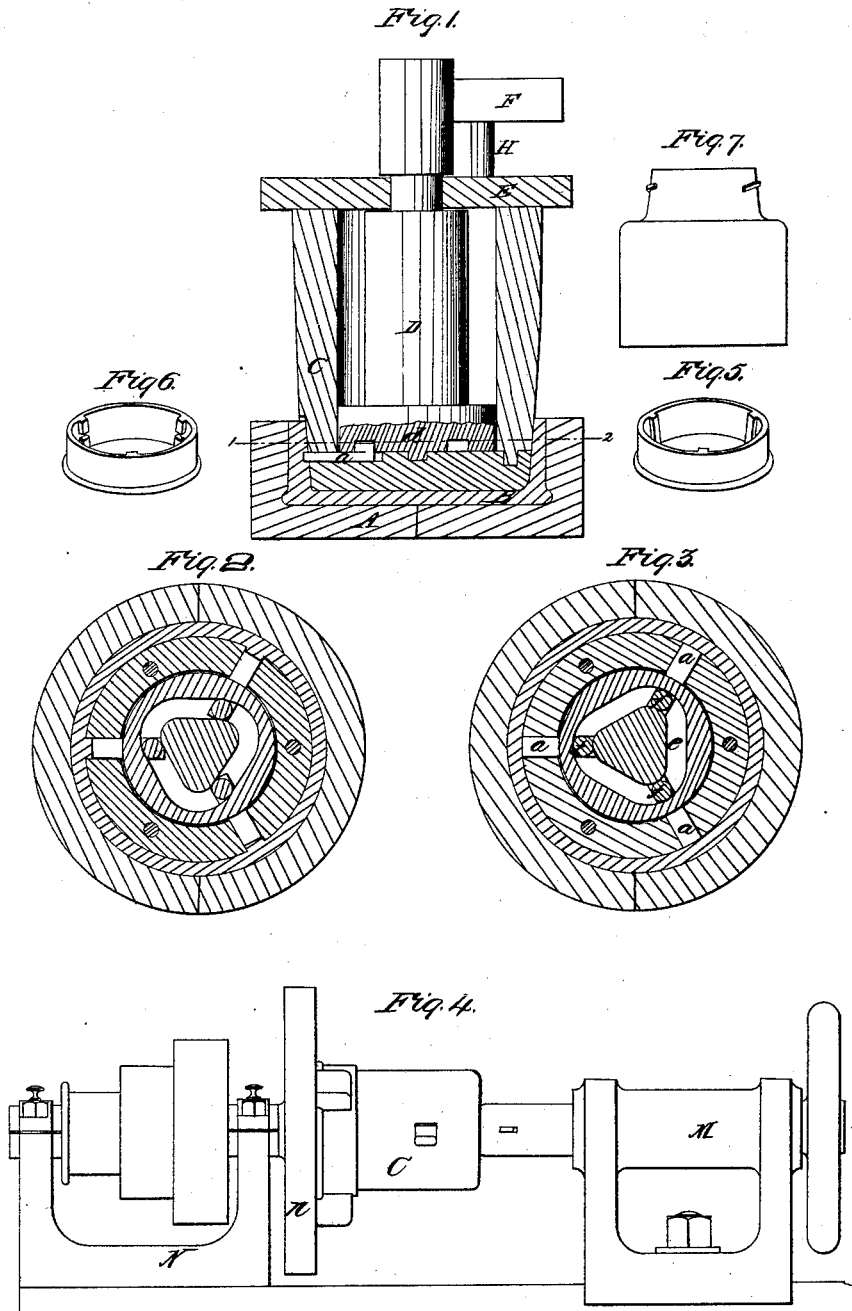


T. R. Hartell,

Tool for Making Glass Stoppers.

No 21,831.

Patented Oct. 19, 1858.



UNITED STATES PATENT OFFICE.

THOMAS R. HARTELL, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR MAKING GLASS STOPPERS FOR BOTTLES, &c.

Specification forming part of Letters Patent No. 21,831, dated October 19, 1858; Reissued April 24, 1860, No. 949.

To all whom it may concern:

Be it known that I, THOMAS R. HARTELL, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Manufacturing Stoppers for Bottles and other Vessels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates to apparatus for manufacturing that class of glass stoppers or caps for vessels, which have notches on the inside for receiving inclined projections on the neck of the vessels, and my improvement consists in a certain combination of a hollow block or die with vertical recesses, a spindle, and disk with a groove for operating a system of radial punches, the whole being arranged for joint action substantially in the manner fully set forth hereafter, so as to form glass stoppers of the above mentioned description with rapidity and perfect accuracy.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawing, which forms a part of this specification; Figure 1, is a sectional elevation of my improved apparatus for making glass stoppers or caps for bottles and other vessels. Fig. 2, a sectional plan on the line 1, 2 (Fig. 1). Fig. 3, the same as Fig. 2, but with the radial punches in a different position. Fig. 4, a view of my improvement, as applied to a lathe for grinding the stoppers or caps. Fig. 5, a perspective view of the stopper inverted, and prior to the formation of the notches. Fig. 6, a perspective view of the stopper, after the notches have been formed. Fig. 7, an exterior view of the neck of the vessel, to which the stopper has to be applied.

A is the mold or box for receiving the molten glass, from which the stopper B is formed, C the die for forming the interior of the stopper, and *a, a, a*, the radial punches. The box A is in two halves held together during the formation of the stopper by any convenient appliances, and readily separated when the stopper has been formed, so that the latter, with any moldings or devices which may be embossed on its outer

surface, may be easily withdrawn. The block or die C has a circular recess or chamber concentric with the exterior, and in the bottom of this chamber fits a disk *d*, attached to or forming a part of the spindle D, which is guided laterally as well as retained in its proper vertical position by the transverse bar E, which is secured to the top of the block. An arm F projects from the upper end of the spindle D, serving to turn the latter partially around to an extent limited by pins H, which project above the transverse bar E. On the underside of the disk *d* is a recess of the form of an equilateral triangle with rounded corners. Into this recess fits the round projection on one end of each of the radial punches *a, a, a*, which are arranged to slide in grooves formed in the bottom of the recess of the block C, and to fit snugly into and slide freely in orifices passing through the sides of the block. At the side of the block, and where each of the orifices for the reception of the punches is situated, a perpendicular recess, as represented in Figs. 1 and 2, is formed, for a purpose which will be rendered apparent hereafter.

In forming the stopper, the molten glass is first poured into the mold A, when the block C (with its shaft D turned so that the recess *e* and punches *a* are in the position shown in Fig. 2) is pressed into the glass. A plain circular recess, with three vertical ribs corresponding to the three vertical recesses of the block, is formed in the glass, which, if removed from the mold, would present the appearance represented in Fig. 5. Prior to withdrawing the block, however, and while the glass is still hot, the operator turns the spindle D, until the disk assumes the position shown in Fig. 3. By this movement of the disk, the punches *a* are projected outward simultaneously from notches in the ribs, previously alluded to as having been produced by the vertical recesses of the block C. The shaft D is now turned to its former position, the punches thereby withdrawn from their notches, the block raised from the glass, the mold separated, and the newly formed stopper or cup, which has now assumed the form represented in Fig. 6, is deposited in the annealing oven, prior to being submitted to the operation of grinding. This is performed by an instrument similar to that above described.

The spindle D, however, of the block is secured to the spindle of the back headstock M of an ordinary lathe, the glass stopper being "chucked" to the face plate *n* of the front headstock N. Suitable grinding material being applied to the inside of the stopper, and the latter caused to revolve, the end of the block (which in this instance is smaller in diameter than that, by which the interior of the stopper was formed), is gradually brought to bear on the bottom of the stopper, which is soon reduced to a uniform level. The block is then gradually turned around, which, (as its spindle remains stationary) serves to project the punches outward, and the grinding material which adheres to their ends, soon reduces the notches in the vertical strips to a uniform level surface, which must of necessity be parallel to the previously ground surface of the bottom of the stopper. The importance of grinding the notches true with the bottom of the stopper, will be better understood by referring to the Fig. 7, in which is represented the neck of the vessel, to which the stopper or cap is to be applied. On the exterior of the neck are three inclined projections, arranged to slide into the notches of the cap. The top of the vessel's mouth is ground perfectly true, and the inclined

projections arranged at equal distances from the edge of the vessel, so that, when the cap is dropped over the mouth and turned around, so that the inclined projections shall catch into the notches, it is evident that the ground bottom of the stopper must bear with accuracy on the ground edge of the vessel's mouth. Should the notches in the cap, however, not be true with the ground bottom, it will be evident, that the two ground surfaces cannot be fitted tightly together.

Although I prefer three radial punches to any other number, four or more may be used to advantage in manufacturing stoppers or caps for the larger class of vessels.

I claim and desire to secure by Letters Patent:

The block or die C with its vertical recesses, in combination with the spindle D, its grooved disk *d* and the radial punches *a, a, a*, when the whole are arranged for joint operation substantially as and for the purpose herein set forth.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

THOS. R. HARTELL.

Witnesses:

HENRY HOWSON,
HENRY ODIORNE.