

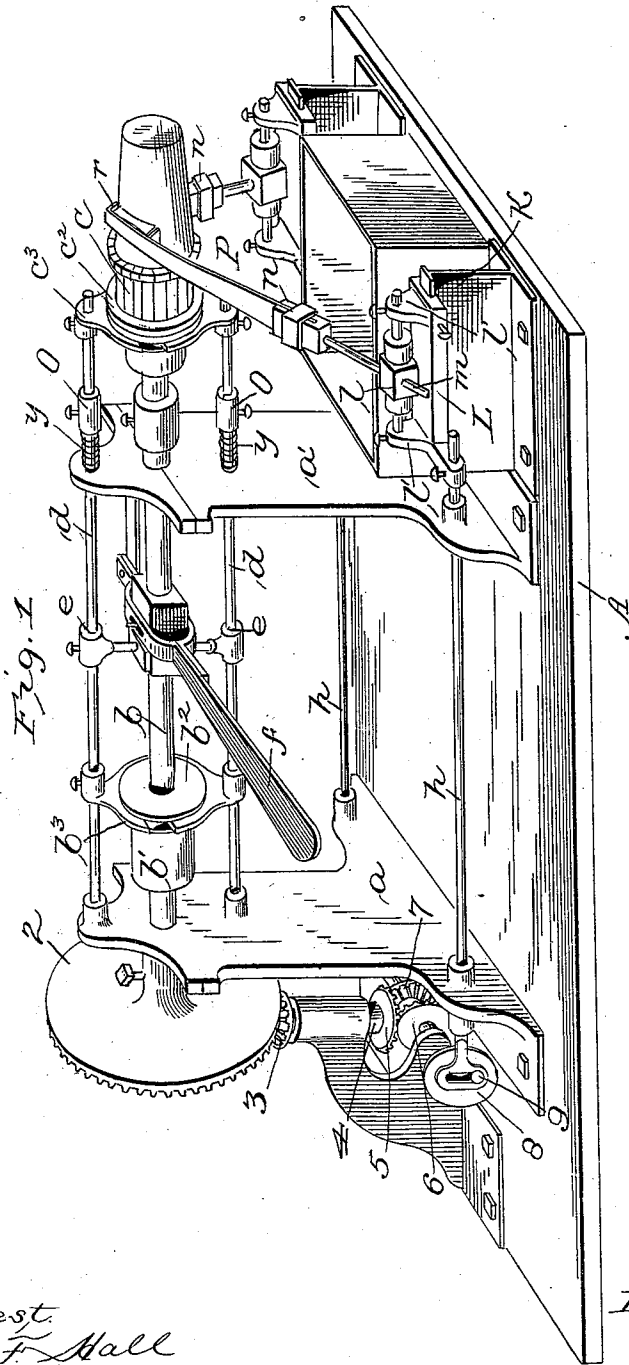
(No Model.)

3 Sheets—Sheet 1.

O. F. LILJEQVIST.  
MACHINE FOR ORNAMENTING GLASSWARE.

No. 549,376.

Patented Nov. 5, 1895.



Attest  
Wm. F. Hall  
J. M. Spear

Inventor  
Otto F. Liljeqvist  
By J. M. Spear Atty.



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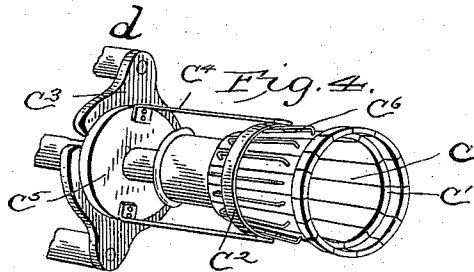


Fig. 5.



Fig. 6.

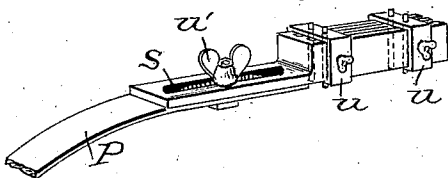


Fig. 9.

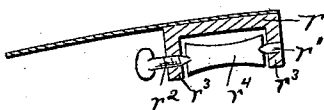


Fig. 7.

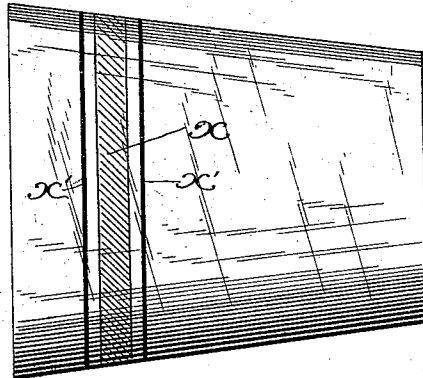
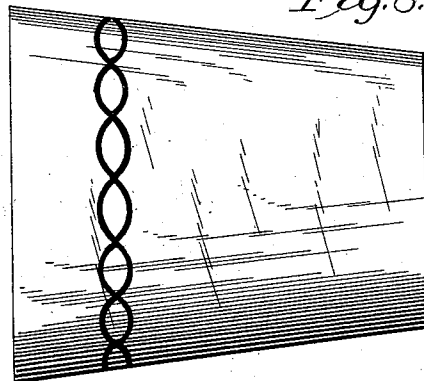


Fig. 8.



Attest  
Wm. F. Hall  
Jm. Spear

Inventor  
Otto F. Liljeqvist  
By *Wm. Spear*  
Atty

# UNITED STATES PATENT OFFICE.

OTTO FREDRIK LILJEQVIST, OF WHITE MILLS, PENNSYLVANIA.

## MACHINE FOR ORNAMENTING GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 549,376, dated November 5, 1895.

Application filed February 26, 1895. Serial No. 539,833. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO FREDRIK LILJEQVIST, a subject of the King of Sweden and Norway, residing at White Mills, in the county of Wayne and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Ornamenting Glassware, of which the following is a specification.

My invention relates to machines for ornamenting glassware—such as drinking-glasses, tumblers, and the like—by forming straight and irregular bands around the peripheries thereof.

The invention appertains more particularly to the means for holding and operating the marking-tools and to the means for securing the glass to be ornamented during the marking operation.

It also includes the details of construction, as will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a perspective view of the machine. Fig. 2 is a front elevation. Fig. 3 is a detail of one form of tool-holder. Fig. 4 is a detail of the preferred form of chuck. Fig. 5 is a detail of the marking-tool. Fig. 6 is a detail of another form of tool-holder and the tool. Figs. 7 and 8 are views of the ornamented articles. Fig. 9 is a detail of another form of tool-holder.

In the drawings, A represents the base, carrying the vertical standards  $a$   $a'$ , adapted to be secured to a suitable bench or table. In the upper part of the standards is journaled the shaft  $b$ , which carries the driving-pulley  $b'$ , to which motion is imparted by a belt (not shown) from any suitable source of power. A chuck  $c$ , preferably of wood, is secured to the end of the shaft  $b$ , and is provided with a series of longitudinal slits to permit it to be expanded to receive the article to be ornamented. The tumbler or drinking glass to be ornamented is fitted within this chuck, the end of the glass bearing against a shoulder  $c'$  around the inner periphery thereof. A collar  $c^2$  is fitted on the outer periphery of the chuck and is adapted to be slipped up near the forward end thereof to contract the slitted portion and cause it to securely clamp the glass. This collar  $c^2$  is operated by rods  $d$ , carrying segmental bearing-pieces  $c^3$ , which

engage an annular groove in the collar, the said rods passing loosely through openings provided in the vertical standards. As not all the tumblers or articles which it may be desired to engrave are round, it will be seen that if the collar be made of rigid material it will pinch the chuck down hard upon the glass and will tend to break an irregular article. In order to avoid this, the band or collar around the chuck may be made of thin flexible steel, preferably about an inch wide by about one thirty-second of an inch in thickness, and the arms  $c^4$  are riveted to this band and extend backward to the main collar  $c^5$ . This construction is clearly shown in Fig. 4. It is found that in using this band the wood, which is softened by the water, will become worn or frayed. To obviate this, staples or dogs  $c^6$  of steel wire are placed in the sections of the chuck and form a bearing for the ring.

Collars  $O$  are secured to the rods  $d$  by thumb-screws, and between these collars and the vertical standard  $a'$  are helical springs  $y$ , which surround the rods  $d$  and tend normally to force the collar  $c^2$  on the forward part of the chuck, thus contracting the end of the same to clamp the article. A lever  $f$  is secured to boxing held loosely upon the shaft, and from this boxing the collars  $e$  extend to and engage with the rods  $d$ . One end of this lever is pivoted to a bar projecting horizontally from the standard  $a'$ , the opposite end being provided with a handle to be grasped by the operator, whereby the rods may be drawn back against the pressure of the springs to unclamp the chuck. The driving-pulley  $b'$  is provided with a rigidly-attached disk  $b^2$ , having a groove in its periphery in which rest two segmental plates  $b^3$ , which are connected to the rods  $d$ , so that as these are moved to clamp the article upon the chuck the driving-pulley will be moved upon the shaft, and as the shaft is tapered at this point the pulley will engage with the enlarged part of the shaft to drive the same, thus forming a friction-clutch. I do not, however, limit myself to this particular form of clutch, as some other might be substituted therefor.

The rear end of the shaft  $b$  carries a beveled gear 2, that meshes with a gear 3, journaled on a vertical spindle 4, which imparts

motion through the beveled gear 5 to the horizontally-journaleed gears 6 and 7. The disks 8, secured on each end of the horizontal shaft, are provided with pins 9, eccentrically 5 secured thereto. These pins project through the vertically-slotted heads of the rods *h*, extending through openings in the standards *a* *a'*, and thus reciprocate the rods. The rods are detachably connected to the plates *L*, 10 which slide upon the tracks *k*, fastened to the base *A*. Projecting upwardly from these plates are the bearings *l'*, in which the shafts of the casing *l* are journaled. The rods *m*, having the clamps *n* secured on the end thereof, 15 are held in the casings and can be adjusted and held by means of thumb-screws extending through the bearings *l'* and engaging with the shafts of the casings.

The spring-arms *P* are adjustably held at 20 one end by the clamps *n* and carry at their opposite ends the frames *r* for holding the rubbing or engraving tools. These frames consist, in one instance, of the blocks or projections *r*<sup>3</sup>, secured to the spring-arms, and 25 one of these blocks or projections carries a pointed stud *r'*, projecting inwardly, while the other has a threaded opening through which a pointed screw *r*<sup>2</sup> extends. A marking-block *r*<sup>4</sup>, of steel, having an indentation in each end, 30 is carried by this frame *r*, the conical ends of the said stud and screw engaging with said indentations, thus forming a pivoted bearing for the block, allowing the same to conform to the longitudinal contour of the glass. The 35 surfaces of these blocks are plain and curved to fit the contour of the glass to be ornamented, and they are used in forming the wide band, as shown at *x*, Fig. 7. For forming the irregular line (shown in Fig. 8) I 40 use another form of tool and holder. The holder consists of a block having a series of forwardly-extending fingers and a reduced rear extension slotted at *s*. The markers or tools are carried by the rectangular frames *u*, 45 the tool extending through the space between the fingers and projecting out from the top and bottom of the frame. These frames are adjustable to and from each other, and are held rigidly by thumb-nuts, the bolt *u'* passing through the slot *s* and the spring-arm, 50 thus holding the two together. In place of these frames a block *t* (see Fig. 3) may be secured to the end of the arms *P*. A slit is made in the block and the thin blade *t'* inserted therein. This blade is used in forming the line *x'*, Fig. 7, and is preferably of thin steel about a sixteenth of an inch by a 55 quarter of an inch wide and three inches long.

It will be understood that each side of the 60 machine is provided with a similar mechanism for holding the spring-arms carrying the engraving-tool, and in some cases two arms may be put on the same side. This is desirable in ornamenting the glass, as shown in 65 Fig. 7. In this case the plates *S* are disconnected from the reciprocating rods and re-

main stationary. One of the plates carries two spring-arms, and these arms carry the tools *t'* for forming the line *x'*. The opposite 70 plate carries a single arm and the marking-block is carried on the end of this arm. This block rests upon the glass between the tools *t'* and forms the part *x*.

In operation the machine works as follows: The tumbler is inserted in the end of the 75 chuck and the lever *f* released. The springs *y* force the collar *c*<sup>2</sup> in place and clamp the tumbler firmly within the end of said chuck and draw the driving-pulley upon the enlarged part of the shaft to drive the same. 80 The rubbing or engraving blocks are now brought to bear upon the glass, the spring-arms supplying the frictional contact necessary. The beveled gear 2 is rotated by the rotation of the shaft *b* and transfers motion 85 through the series of beveled gears to the disks 8. This reciprocates the rods *h* and the plates *L*, secured on the end thereof, thus reciprocating the arms *P* and the engraving-blocks carried thereby. When forming the 90 straight line, as shown in Fig. 7, the rod *h* is disconnected from the plate *L*, thus allowing the same to remain stationary during the rotation of the chuck and the tumbler carried thereby. The glass is rotated during the reciprocating of the engraving-blocks, said 95 blocks reciprocating more rapidly than the shaft *b* rotates. The length of stroke of the rod *g* can be adjusted by moving the eccentric-pin nearer to or farther from the center 100 of the disk. Sand is fed under the rubbing-blocks during their operation, the tub *u* being provided to catch the waste. To remove the glass, the lever is forced to the left, drawing the collar *c'* back against the pressure of the 105 springs *y* and allowing the end of the chuck to be expanded and the glass removed. A collar *v* is secured on the shaft *b* to act as a stop against the end of the collar *c*. The pulley *b'* is moved when said lever is reversed 110 onto the tapered part of the shaft by the disk *b*<sup>2</sup> and revolves freely thereon, allowing the shaft to remain stationary.

The engraving is accomplished by means of sand applied either by hand from a tank 115 below or from a tank overhead or by a feeding-up machine, as is found most desirable.

Having described my invention, what I claim is—

1. A glass ornamenting machine, comprising the standards, the shaft journaled therein, the slitted chuck carried by said shaft, the collar encircling the chuck, the rods sliding in the standards, the connection between said rods and collar, the lever for reciprocating 125 said rods to clamp and unclamp the chuck, and the clutch mechanism between the shaft and source of power, also operated by the movement of said lever, substantially as described. 130

2. In combination with the machine standards, the shaft journaled therein, having a

tapered portion, the chuck for the article to be operated upon carried by the shaft, the rods sliding in the frame and arranged to open and close the chuck, the lever for reciprocating said rods, the driving pulley loose on the shaft, and the connection between said rods and driving pulley whereby the reciprocation of the rods will slide the driving pulley upon the tapered portion of the shaft, substantially as described.

3. In combination, the standards, the shaft journaled therein, the chuck carried by the shaft, the collar sliding on the chuck, and having a grooved portion, the rods sliding in the frame and having segments engaging said grooved portion, the springs encircling said rods and bearing against adjustable collars thereon, the boxing on said shaft having arms adjustably connected to the rods, the lever connected to said boxing, the driving pulley loose on said shaft and having an annular grooved portion, and the segments on the shaft engaging said grooved portion, said shaft having a tapered portion to be engaged by the pulley to form a friction clutch, substantially as described.

4. A chuck for glass ornamenting machines, comprising the slitted portion, the longitudinally arranged staples carried thereby, the metallic collar encircling the chuck and bearing upon the staples, and means for reciprocating the collar, substantially as described.

5. In combination the main shaft, the work holder carried thereby, the sliding carriages carrying pivoted engraving arms, the reciprocating rods with operating connections to the main shaft, and detachable connections between said sliding rods and carriages, substantially as described.

6. In combination, the standards, the main shaft and chuck carried thereby, with means for operating them, the track arranged parallel to the work, the carriage sliding on said track, the lugs or ears extending upward therefrom, the shaft journaled in said ears, the engraving arm carried by said shaft, and

means for operating the carriage, substantially as described.

7. In combination, with the main shaft and chuck with means for operating them, the carriage arranged to reciprocate parallel to the axis of said main shaft and chuck, the engraving arm carried thereby, the sliding rod having a detachable connection with the carriage at one end and having a transverse slot in the other end, the disk having a pin engaging said transverse slot, and driving connections for said disk, substantially as described.

8. In combination with the revolving work holder, and the reciprocating carriage, with means for operating them, the spring arm pivotally mounted in the carriage, the block or enlargement carried on the end of said spring arm, and the engraving tools carried by said enlargement, substantially as described.

9. In combination with the revolving work holder and the reciprocating carriage, with means for operating them, the spring arm pivotally mounted in the carriage, the enlarged portion adjustably carried on said spring arm, and the engraving tools carried by said enlarged portion, substantially as described.

10. In combination with the spring arm, the enlarged portion adjustably carried thereby, and the engraving pins adjustably mounted in said enlarged portion, substantially as described.

11. In combination, the spring arm, the enlarged slotted portion adjustably carried by said arm, the engraving tools seated in the slots of the enlarged portion and the clamping bands encircling said enlarged portion, substantially as described.

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

OTTO FREDRIK LILJEQVIST.

Witnesses:

JACOB SWANSON,  
A. E. KELLOGG.