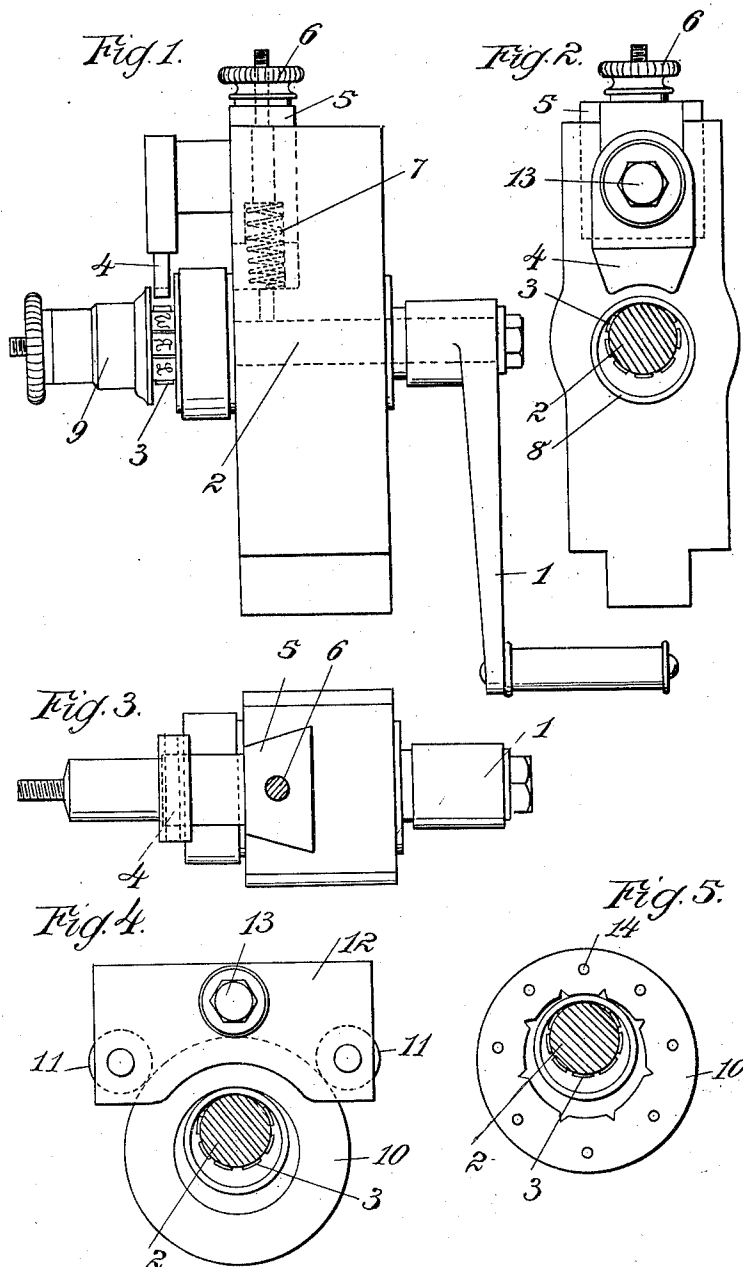


K. SCHWAHN.
 APPARATUS FOR ENGRAVING THE INTERIOR SURFACE OF HOLLOW ARTICLES.
 APPLICATION FILED SEPT. 23, 1909.

1,003,126.

Patented Sept. 12, 1911.

3 SHEETS—SHEET 1.



Witnesses:
E. C. Schuermann
N. M. Horn

Inventor:
Konrad Schwahn
 by *Henry Goldbrough Miller*
Att'y

K. SCHWAHN.

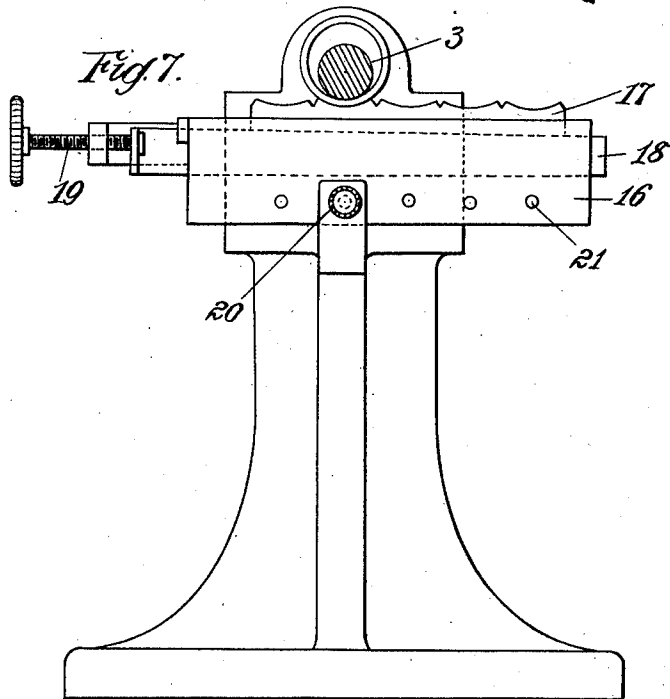
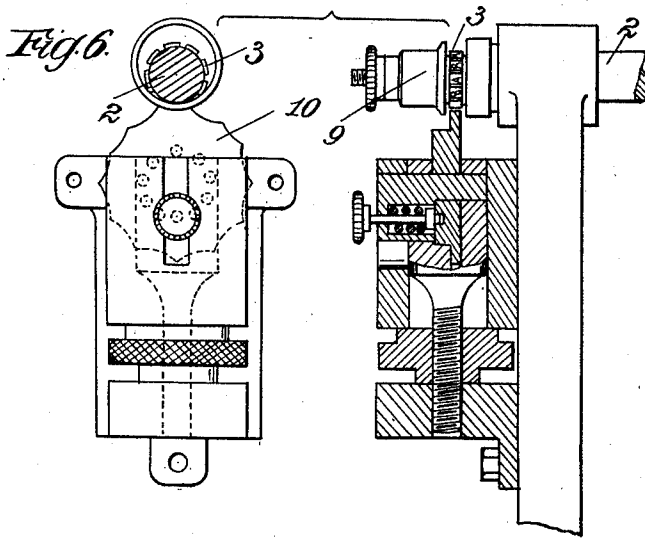
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3 SHEETS—SHEET 2.



Witnesses:

E. C. Schuermann.

W. M. Donn.

Inventor:

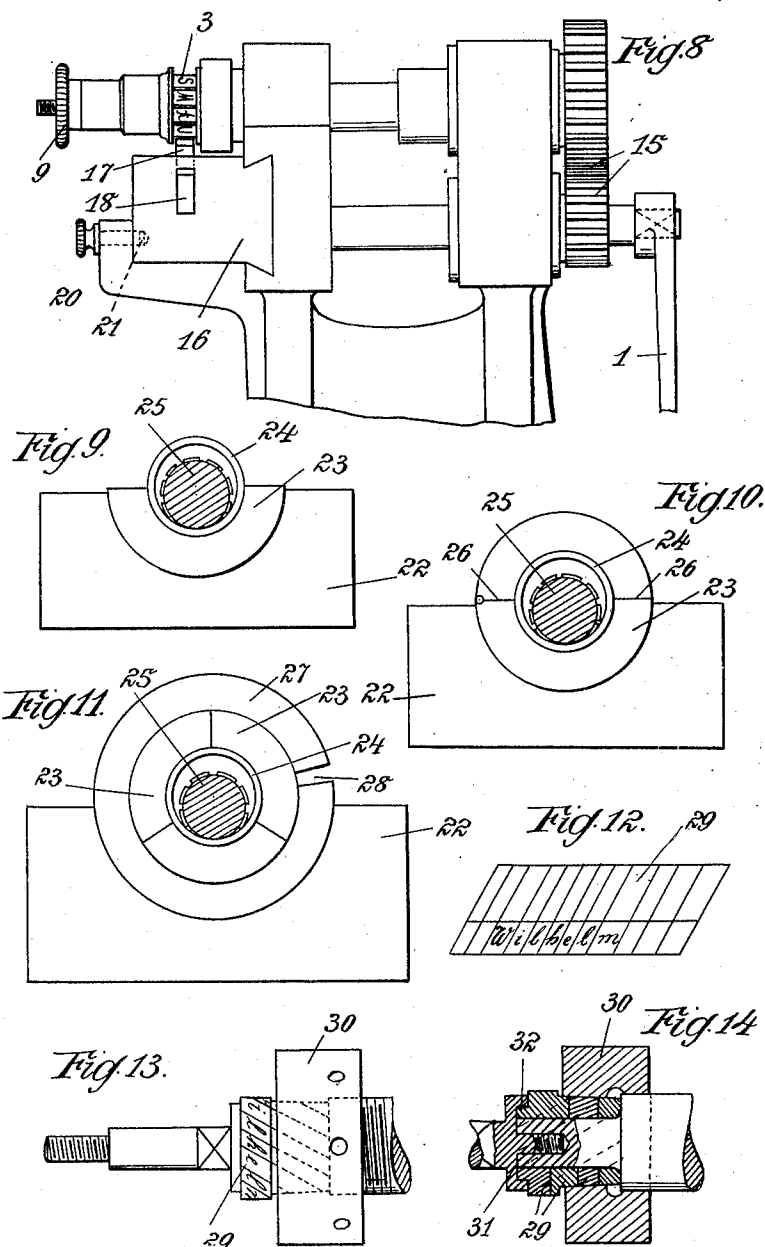
Konrad Schwahn
Permit Goldsborough Will
Attys

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3 SHEETS—SHEET 3.



Witnesses:
 E. C. Schumann
 N. M. Down

Inventor:
 Konrad Schwahn
 by Lemuel Golding & Co.
 Attys.

UNITED STATES PATENT OFFICE.

KONRAD SCHWAHN, OF HANAU, GERMANY.

APPARATUS FOR ENGRAVING THE INTERIOR SURFACE OF HOLLOW ARTICLES.

1,003,126.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed September 23, 1909. Serial No. 519,169.

To all whom it may concern:

Be it known that I, KONRAD SCHWAHN, jewelry manufacturer, a subject of the German Emperor, and resident of Hanau, in the Kingdom of Prussia, Germany, with the post-office address Wilhelmstrasse No. 11, have invented new and useful Improvements in Apparatus for Engraving the Interior Surfaces of Hollow Articles, of which the following is a specification.

This invention relates to a modified construction of the apparatus described in my Patent No. 990,912, May 2, 1911 for engraving the interior surface of hollow articles, more especially rings. In that apparatus the support for the ring while it is being rolled over the matrix roller is a movable table or rotary roller having at its periphery a groove corresponding with the outer periphery of the ring.

According to the present invention the surface of the support is a concave curve and the support either rotates with the ring or is stationary so that the latter slides on it. The curved surface is, of course, of the same cross section as the ring. It has been proved that when the hollow surface is stationary, the engraving is very good and the ring becomes somewhat polished on its outer surface. The support may in this case be constructed as an annular disk the inner periphery of which is grooved to correspond with the cross section of the ring. The disk is arranged eccentrically to the matrix roller and between it and the latter the ring to be engraved is placed. If the disk is to rotate with the ring it is preferably journaled on rollers. If it is to be stationary, it may be reduced to a segment of a disk, which segment can be exchanged for another of different cross section when the type of ring is changed. The various segments may be combined to form a single disk, which is either an annulus in which case the several supporting surfaces are on the inner periphery, or a complete disk having the curved surfaces on the outer periphery. It is then only necessary to set this disk by rotating it so that the required curve is opposite the operative point of the matrix roller. Finally the curved surfaces may be on the edge of a straight rail, the position of which is shifted relatively to the matrix roller when the type of ring is changed.

The upper part of the apparatus de-

scribed in the aforesaid patent may be used as the rail, the whole of the supporting slide remaining stationary during the engraving.

Several forms of the apparatus are shown in the accompanying drawings wherein:

Figures 1, 2 and 3 are a side elevation, front elevation and plan respectively of the construction with a fixed interchangeable segment support. Fig. 4 is a part elevation of a form having a rotating annular disk arranged eccentrically to the matrix roller. Fig. 5 is a part elevation of a form having a fixed annular disk with the curved surfaces on its inner periphery. Fig. 6 shows in front elevation and longitudinal section a form having a fixed disk with the curved surfaces on its outer periphery. Figs. 7 and 8 are a front elevation and side elevation respectively of a construction in which the curved surfaces are on an adjustable rail. Figs. 9, 10 and 11 show three further modifications. Fig. 12 shows a development of a matrix roller and Figs. 13 and 14 show the roller in side elevation and longitudinal section respectively.

In the construction shown in Figs. 1 to 3 the matrix roller 3 on the shaft 2 is rotated by the handle 1. Above this matrix roller there is the segmental support 4, the curved face of which corresponds with the diameter of the ring. The support is adjustable in the slide 5 by a screw and nut 6 in a direction radial to the matrix roller and is constantly pressed away from the latter by a spring 7. The ring 8 to be engraved is placed over the matrix roller, and is prevented from slipping off by the sleeve 9. The support 4 is then so adjusted by the screw 6 that it bears tightly on the ring 8; by now rotating the handle 1 the ring slips in the curve of the support and is at the same time engraved. In the form, in which the support is a ring adapted to rotate, as in Fig. 4, this ring 10 is mounted eccentrically to the shaft 2 and rotates with its periphery against two rollers 11 journaled in a casing 12 partly surrounding the ring and mounted by a screw 13 a slide similar to the slide 5 (Fig. 2). When the handle 1 is rotated, the revolving ring 8 takes the ring 10 with it and there is no slipping between them. If the supporting ring is to be fixed, its inner periphery has a number of curved facets (Fig. 5) corresponding with the rings of different radius.

When the size of the ring to be engraved is changed the ring 10 is turned and fixed by a suitable device such as a pin engaging in one of the holes 14, with the required
5 facet in the supporting position.

In the construction shown in Fig. 6 the several curved facets are on the outer periphery of the supporting ring 10.

In the construction shown in Fig. 6 the
10 several curved surfaces or facets are on the outer periphery of a vertically adjustable disk 10^b which is raised into engagement with the ring from below. This disk is also adjustable angularly by means such as those
15 shown in order to bring the several facets into operative position.

In the construction shown in Figs. 8 and
9 the matrix roller 3 is driven by a handle 1 through gearing 15, and there is a ring supporting slide 16. This slide, however, does
20 not move during the engraving but is adjusted beforehand for the particular diameter of the ring to be engraved. The operative surface of the slide is constituted by a
25 rail 17 having a number of curved surfaces corresponding to the different diameters of rings; and said rail is adjustable in a vertical direction with respect to the slide and
also with respect to the ring, by means such
30 as a wedge 18 interposed between the slide and rail and adjustable longitudinally by a screw 19. In this manner the curved surface acting for the time being as the support
35 can be exactly adjusted vertically to suit the thickness of the ring. The slide carrying the rail 17 is shifted before the engraving operation so as to bring the curved surface corresponding with the ring to be
40 engraved under the matrix roller 3. The spring pin 20 then snaps into one of the holes 21 and the slide is retained in place. The ring is then placed between the support
and matrix holder 3 and the sleeve 9 is
45 screwed on to hold the ring in place. By turning the screw 19 the wedge 18 is moved and the rail 17 raised sufficiently to hold the ring against the matrix roller 3. The
50 handle 1 is then rotated and the matrix roller is rotated through the gearing 15; and ring 8 slips in the curved surface of the support and is engraved. The gearing 15
55 reduces the speed of rotation of the handle 1 so that the force exerted is greater and more uniform than if a higher speed were used.

In the construction shown in Fig. 9 the semi-circular support 23 rests in the stationary bearer 22, the ring to be engraved
60 resting in the support and therefore lying closely to it. When the matrix roller 25 is rotated the ring 24 and its support 23 rotate with it, the latter rotating in the fixed bearer 22. Between 22 and 23 rollers or
65 balls may be provided if necessary to lessen the friction. Between the ring 24 and the

support 23 strips of soft material such as velvet, leather or the like may be inserted to insure the two rotating together. In the construction shown in Fig. 10 the support 23
70 completely surrounds the ring 24. It is divided into two parts at 26, the two parts being connected together by hinges or the like. In both these last constructions the support 23 may be rigidly connected with
75 the matrix roller in any suitable manner.

In the construction shown in Fig. 11 the support for the ring 24 is composed of sectors 23 which lie in and are held together by
an outer ring 27. The latter is cut away at
80 28, so that it can be sprung open for removing the sectors 23. The ends 28 may be held together by a screw or key or by hinges, or the outer surface of ring 27 may have a conical thread and a corresponding sleeve
85 may screw on this thread so as to press the ring together. The ring 27 rotates in a suitable bearing 22 and may also be rigidly connected with the matrix roller 25. Instead of the three sectors shown there may of
90 course, be more.

A number of sets of sectors for each size of ring are furnished with each machine, but all the sectors fit the outer ring 27. In ordinary machines of this kind the matrix
95 roller is made up of separate types lying parallel to the axis of the roller. This arrangement has the disadvantage that in cursive writing, which is generally desired, the distance between the separate letters is very irregular, and so the effect is poor.
100 According to the present invention this disadvantage is removed by sloping the types relatively to the axis of the roller in the direction of the slope of the letters. The distance between the letters is then perfectly regular, like cursive writing. Fig
105 12 shows the periphery of such a roller developed along a plane. The types 29 are sloped in the direction of the slope of the letters so that the distance between the letters is that of ordinary writing. Fig. 13 shows such a matrix roller in elevation and
110 Fig 14 in section. The types 29 are held together by the screw sleeve 30, as shown. Preferably, the other end of the types are also held together by a small sleeve so as to prevent them from slipping. The disk 31
115 may be used for this purpose, its flanged edge 32 engaging in a corresponding rabbet in the types. This rabbet may be either
120 cylindrical or conical, the flange 32 being made accordingly.

In order that the types may be easily inserted it is advisable to provide a locking device on the handle or its shaft, such as a
125 clamping screw, brake band or the like so as to hold the handle in any position.

Now what I claim and desire to secure by Letters Patent is the following:

1. In a machine for engraving the in- 130

terior surfaces of finger rings and the like, the combination of a rotary matrix roller, means to rotate said roller with the ring placed thereon, and an abutment or support for the ring having a curved surface to engage the outer surface of the ring, and having a fixed or non-rotative relation with said roller during the engraving operation.

2. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a rotary matrix roller, means to rotate said roller with the ring placed thereon, and a support or abutment for the ring having a curved surface between which and the matrix roller a portion of the ring is clamped, said abutment being fixed with respect to the roller during the engraving operation, to present a fixed curved surface over which the ring slides.

3. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a rotary matrix roller, a support or abutment for the ring having a curved surface between which and the matrix roller a portion of the ring is clamped, said abutment being fixed with respect to the roller during the engraving operation, to present a fixed curved surface over which the ring slides, and means for adjusting said abutment with respect to the matrix roller.

4. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a matrix roller, an abutment fixed with respect to said roller during the engraving operation and having a curved surface between which and the matrix roller a portion of the ring is clamped and on which the ring slides, and means for adjusting said abutment toward and away from the matrix roller.

5. In a machine for engraving the interior surfaces of finger rings and the like, a rotary matrix roller, and a relatively fixed abutment having a plurality of different surfaces between which and said roller portions of the rings are clamped.

6. In a machine for engraving the interior surfaces of finger rings, a rotary matrix roller, and a relatively fixed abutment or support having a plurality of surfaces of different curvature between which and said roller portions of the rings are clamped, the different curvatures of said surfaces correspond to different ring diameters.

7. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a matrix roller, an abutment or support having a plurality of dif-

ferently curved surfaces to cooperate with said roller, and means to adjust said abutment or support in order to bring different surfaces into operative position with respect to said roller.

8. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a matrix roller, an abutment or support having a plurality of different surfaces between which and said roller portions of the rings are clamped, and means to adjust said support or abutment with respect to said roller in order to bring different surfaces into operative position.

9. In a machine for engraving the interior surfaces of finger rings and the like, the combination of a rotary matrix roller, a relatively fixed abutment between which and the roller the ring is positioned during the engraving operation, said abutment having a plurality of differently curved surfaces to correspond with rings of different diameters, means to adjust said abutment bodily toward and away from the matrix roller, and other adjusting means for the abutment to bring different surfaces there- of into operative position.

10. In a machine for engraving the interior surfaces of hollow articles particularly of finger-rings the combination of supporting surfaces for the rings with a rotary roller, having types sloping relatively to the axis of the roller, substantially as and for the purpose described.

11. In a machine for engraving the interior surfaces of hollow articles particularly of finger-rings the combination of supporting surfaces for the rings with a rotary roller, having types sloping relatively to the axis of the roller and held by a sleeve, substantially as and for the purpose described.

12. In a machine for engraving the interior surfaces of hollow articles particularly of finger-rings the combination of supporting surfaces for the rings with a rotary roller, having types sloping relatively to the axis of the roller and held by a sleeve fitting over the front ends of the types, substantially as and for the purpose described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 14th day of September, 1909.

KONRAD SCHWAHN.

Witnesses:

EVA SATTLER,
ROBERT BIRHL.