M. SINGEWALD.

APPARATUS FOR EMBOSSING THE RIMS OF DISKS.

APPLICATION FILED APR. 18, 1914.

1,153,965.

Patented Sept. 21, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

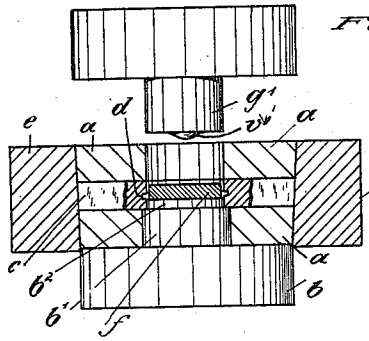


Fig. 2.

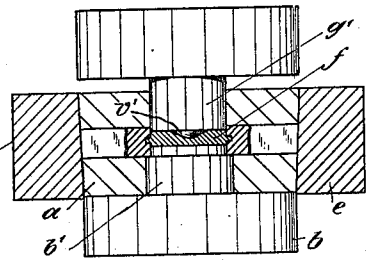


Fig. 3.

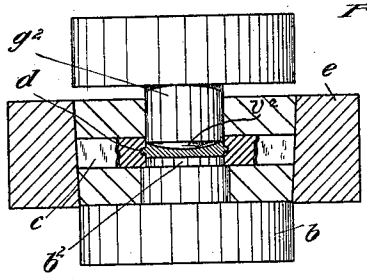


Fig. 4.

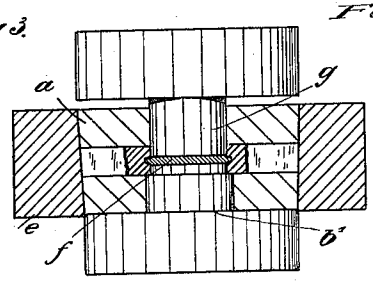
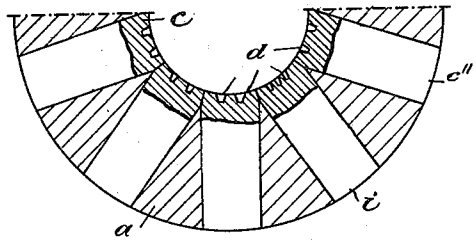


Fig. 8.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5.

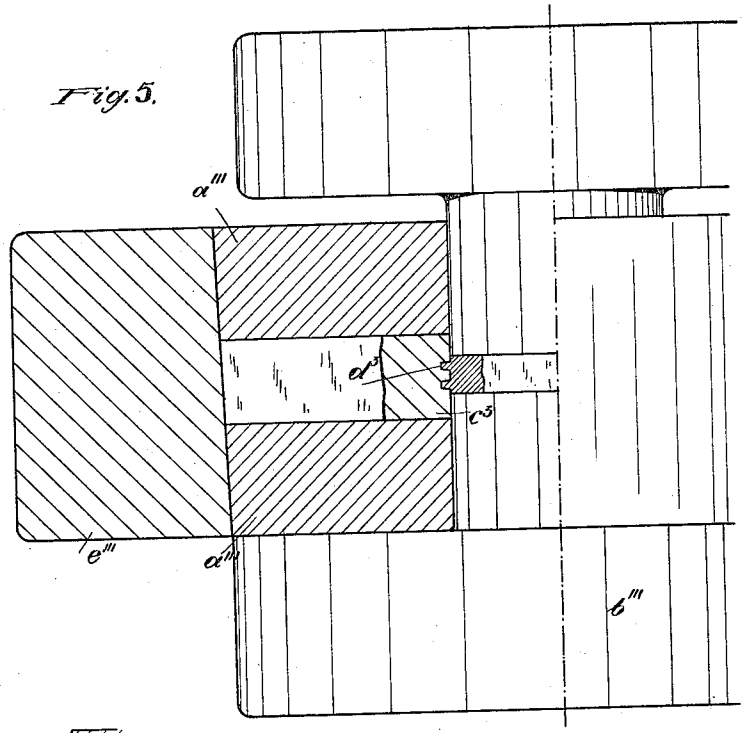
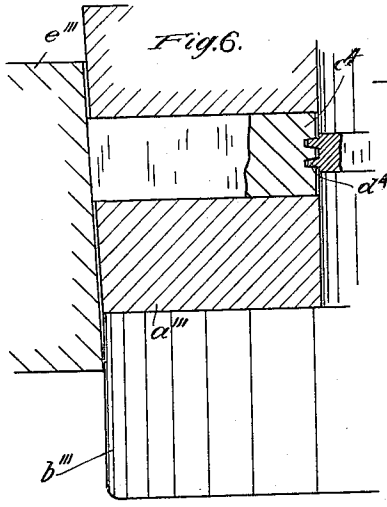


Fig. 6.



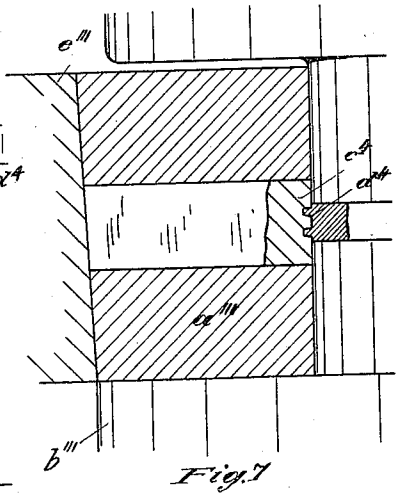


Fig. 7.

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APPARATUS FOR EMBOSSING THE RIMS OF DISKS.

1,153,965. Specification of Letters Patent. Patented Sept. 21, 1915.

Application filed April 18, 1914. Serial No. 832,961.

To all whom it may concern:

Be it known that I, MAX SINGEWALD, a citizen of the German Empire, residing at Leipzig, in Germany, have invented certain new and useful Improvements in Apparatus for Embossing the Rims of Disks, of which the following is a specification.

The invention relates to apparatus for embossing characters or numerals on the rims of disks, for example the rims of wheels for use in paging machines, cash registers, counting apparatus and the like, the apparatus being of the type in which the work is pressed by a stamp in a matrix provided with dies slidable to and from a work-holding cavity in the matrix, said matrix being embraced by an axially movable ring which can be adjusted to lock the dies in position.

According to one part of the invention the work placed in the matrix is first of all engaged at its central part by the stamp, the material being gradually pressed out circumferentially into the intaglios on the dies, this arrangement being adapted to enable steel disks to be provided with numerals or types of uniform sharpness.

According to another part of the invention the machine having the stamp, or a series of stamps, operating as described, is provided with a plurality of sets of dies having intaglio impressions of different depths, which are used successively in order to increase the sharpness of the characters produced.

The invention is illustrated in the accompanying drawings, in which—

Figures 1 to 4 show the essential parts of the apparatus in four different stages of operation, and partly in section. Figs. 5, 6 and 7 show portions of the apparatus to a larger scale, also partly in section, and illustrate the successive use of two sets of dies. Fig. 8 is a sectional plan view, to a larger scale, of a portion of the apparatus shown in Figs. 1 to 4.

Referring in the first instance to Figs. 1 to 4, and Fig. 8, the matrix comprises a thick-walled upper part a and a lower part b provided with a boss b^1 which enters said upper part. The wall of the upper part a is provided with radially disposed apertures i (Fig. 8) in which the dies c can slide. The inner faces of the dies c are curved to conform to the inner periphery of the part a, and are provided with impressions d of the letters or numerals. The dies, when pushed fully into the matrix, abut against each other with the sides of their inner slightly tapered ends, and form with their inner faces an uninterrupted circular surface flush with a portion of the inner periphery of the part a of the matrix. The boss b^1 of the lower part of the matrix is reduced at its upper end b^2 and the reduced part b^2 fits between the faces of the dies c, the latter resting on the shoulder of the boss b^1. The part b^2 terminates just below the characters on the dies. The part a of the matrix is coned and fits into a ring e.

The blank f, which is approximately equal in diameter to the bore in the upper part a of the matrix, is laid on the top of the reduced portion b^2 of the boss b^1, forming the bed of the matrix. The ring e is then pushed up so that it fits tightly on the part a and holds the dies c in their inner positions. Pressure is then applied to the work by the stamps g^1, g^2, g in three consecutive operations, the stamp g^1 having at its lower end a spherical protuberance v^1 of smaller radius than a similar protuberance v^2 on the stamp g^2, and the face of the stamp g being flat. When forced into the matrix the stamp g^1 presses with its protuberance v^1 on the center of the blank f, thus forcing the metal of the blank from the center outward. The blank f is thus compressed at its center to the thickness of the finished work. When the stamp g^1 has been withdrawn, the stamp g^2 inserts its protuberance v^2 into the recess previously formed by the stamp g^1 and continues to squeeze the metal outward, the protuberance v^2 bearing on the blank right up to its edge. The third stamp g then bears on the blank, presses it flat, and completes the squeezing of the metal at the rims into the impressions in the dies. After the disk has been compressed, and the metal squeezed into the impressions in the dies, the latter may be subjected to radial inward pressure.

In Figs. 5 to 7 a^{111} designates the upper part of the matrix, b^{111} the lower part, c^3 one set of dies, c^4 another set of dies, d^3 and d^4 the die impressions, and e^{111} the outer ring. The impressions d^3 and d^4 are of different depths. For instance, the depth of the impressions d^3 in the dies c^3 may be 1 millimeter and the depth of the impressions d^4 in the dies c^4 $\frac{1}{10}$ of a millimeter.

The blank is first placed in the matrix a^{111} provided with the dies c^3. The numerals

or characters are then impressed by pressing the metal by means of stamps provided with spherical faces and the metal is then flattened by means of a flat faced stamp. After withdrawing the latter and the dies c^3 the dies c^4 are inserted into the matrix, or the work is placed in another similar matrix provided with dies c^4. When the work has been clamped between the flat-faced stamp and the part b^{111} the dies c^4 are pushed inward radially by means of the ring e^{111}, whereby the impressions d^4 are forced on to the previously formed characters on the work. The impressions d^4 which are shallower than the impressions d^3 engage the outer surfaces of the characters, which completely fill the recesses in the dies. By this means the characters are rendered very sharp and regular, with flat surfaces, so that subsequent treatment of the work is unnecessary. Words as well as single characters can be formed as will be readily understood.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In apparatus for the purpose set forth, the combination of a matrix having a work-holding cavity, dies movable in said matrix to and from said cavity, means for locking said dies in said matrix, and a stamp movable in said cavity, having on its face a protuberance whereby it first acts on the central part of the work placed in said cavity, and squeezes material from said central part outward toward said dies.

2. In apparatus for the purpose set forth, the combination of a matrix having a work-holding cavity, dies movable in said matrix to and from said cavity, means for locking said dies in said matrix, and a stamp movable in said cavity, having on its face a spherical protuberance whereby it first acts on the central part of the work placed in said cavity, and squeezes material from said central part outward toward said dies.

3. In apparatus for the purpose set forth, the combination of a matrix having a work-holding cavity, dies movable in said matrix to and from said cavity, means for locking said dies in said matrix, and a series of stamps adapted to enter said cavity successively, said stamps having on their faces spherical protuberances of different diameters, whereby each stamp in turn acts on the central part of the work in said cavity, and squeezes material from said central part outward toward said dies.

4. In apparatus for the purpose set forth, the combination of a matrix having a work-holding cavity, dies movable in said matrix to and from said cavity, means for locking said dies in said matrix, a series of stamps adapted to enter said cavity successively, said stamps having on their faces spherical protuberances of different diameters, whereby each stamp in turn acts on the central part of the work in said cavity and squeezes material from said central part outward toward said dies, and another stamp with a flat face adapted to enter said cavity after the last of the previously mentioned series of stamps.

5. In apparatus for the purpose set forth the combination of a matrix having a work-holding cavity and die apertures disposed about said cavity giving access to the latter, a stamp adapted to enter said cavity, having on its face a protuberance whereby it first acts on the central part of the work and squeezes material outward from said central part, a flat-faced die adapted to enter said cavity after the first mentioned die, and a plurality of sets of dies adapted to be successively inserted into said die apertures, the several sets having intaglio impressions of like character but of different depths.

In witness whereof I have signed this specification in the presence of two witnesses.

MAX SINGEWALD.

Witnesses:
RUDOLPH FRICKE,
ALICE DUNGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."