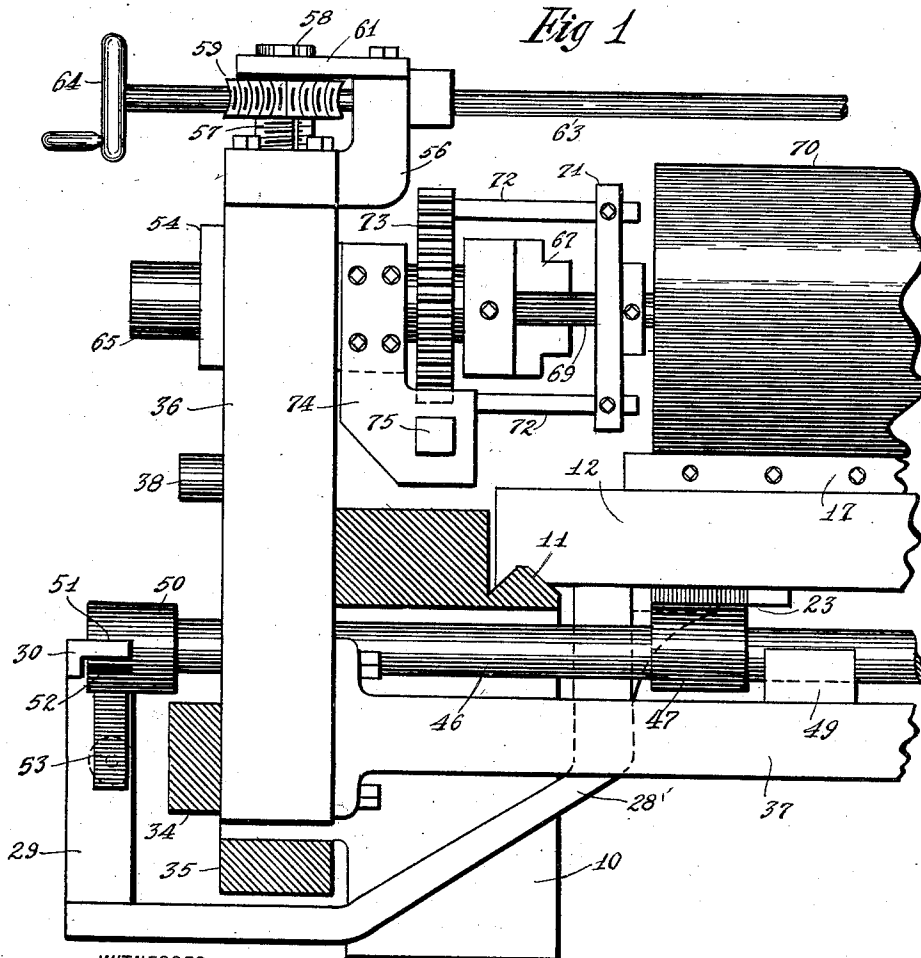
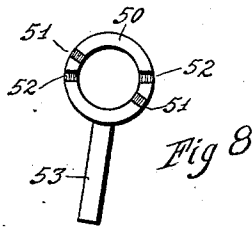
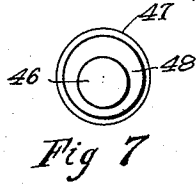


R. MAGRANE.  
IMPRESSING MECHANISM AND PROCESS.  
APPLICATION FILED OCT. 13, 1910.

1,065,951.

Patented July 1, 1913.

5 SHEETS-SHEET 1.



WITNESSES:

*John Bailey.*  
*Mary A. Healey*

INVENTOR

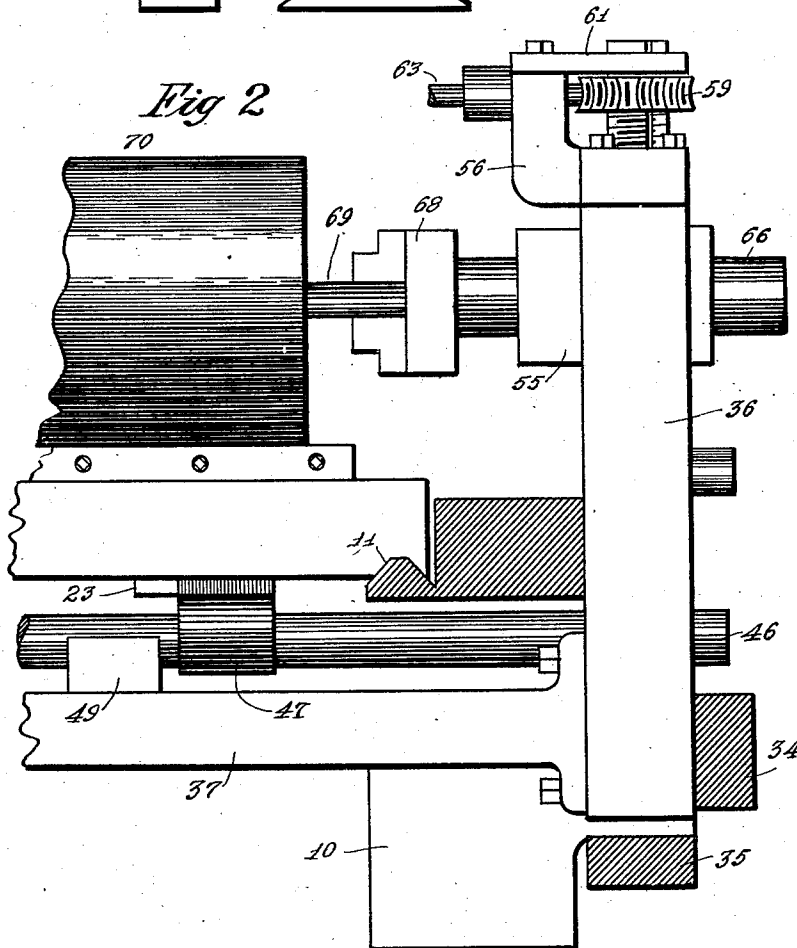
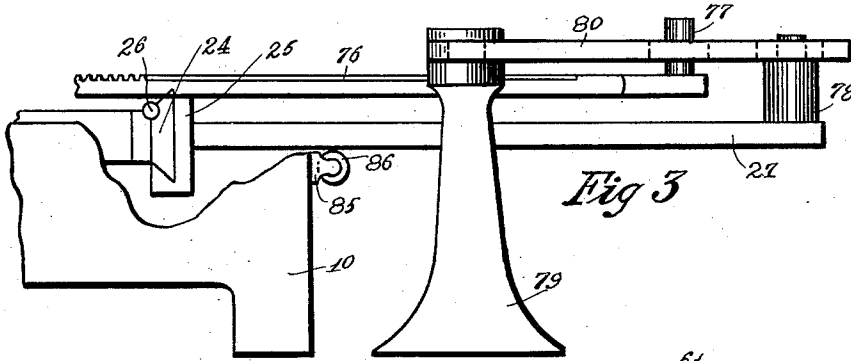
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5 SHEETS—SHEET 2.



WITNESSES:

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Mary A. Healey

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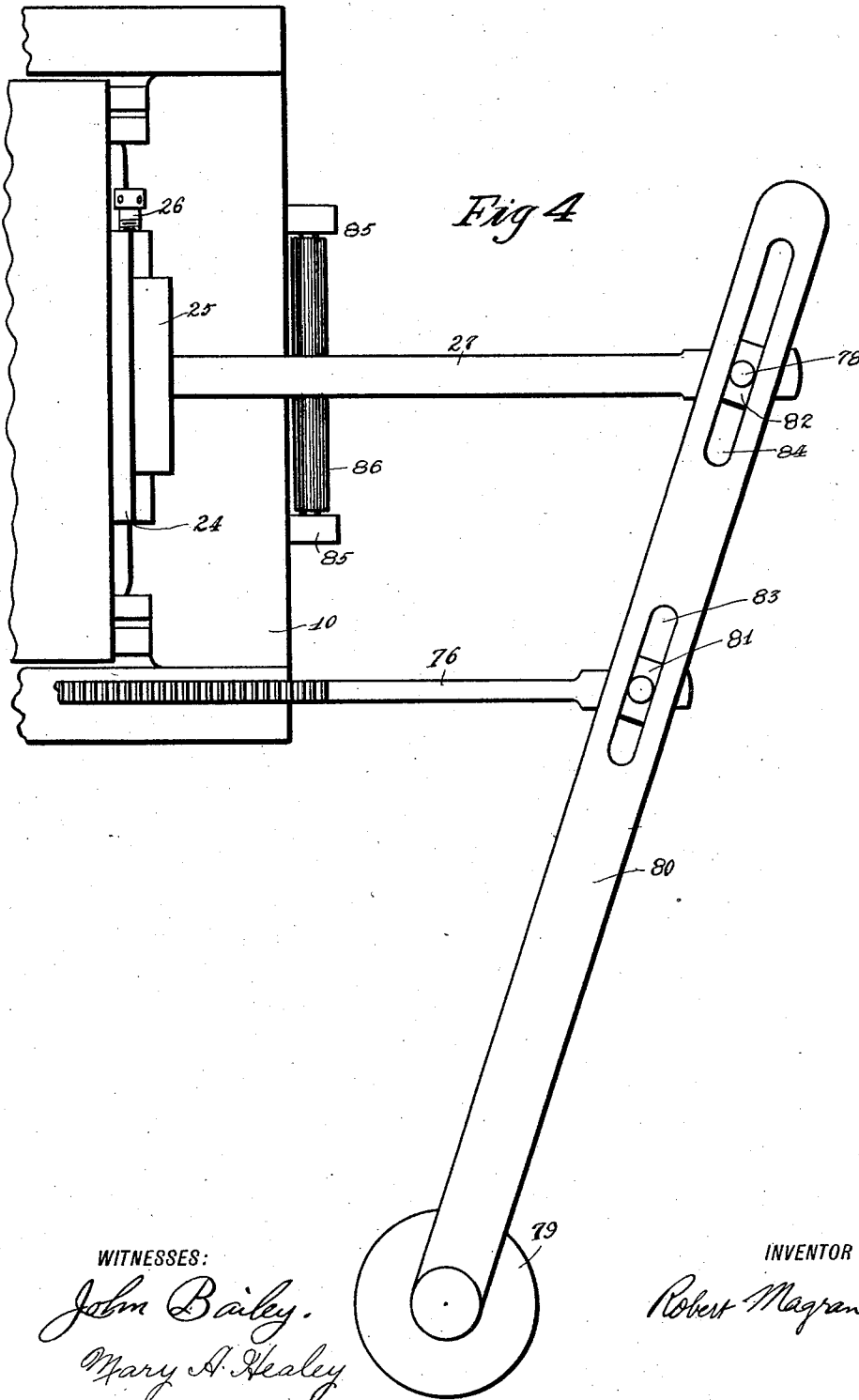
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5 SHEETS—SHEET 3.



WITNESSES:

*John Bailey.*  
*Mary A. Healey*

INVENTOR

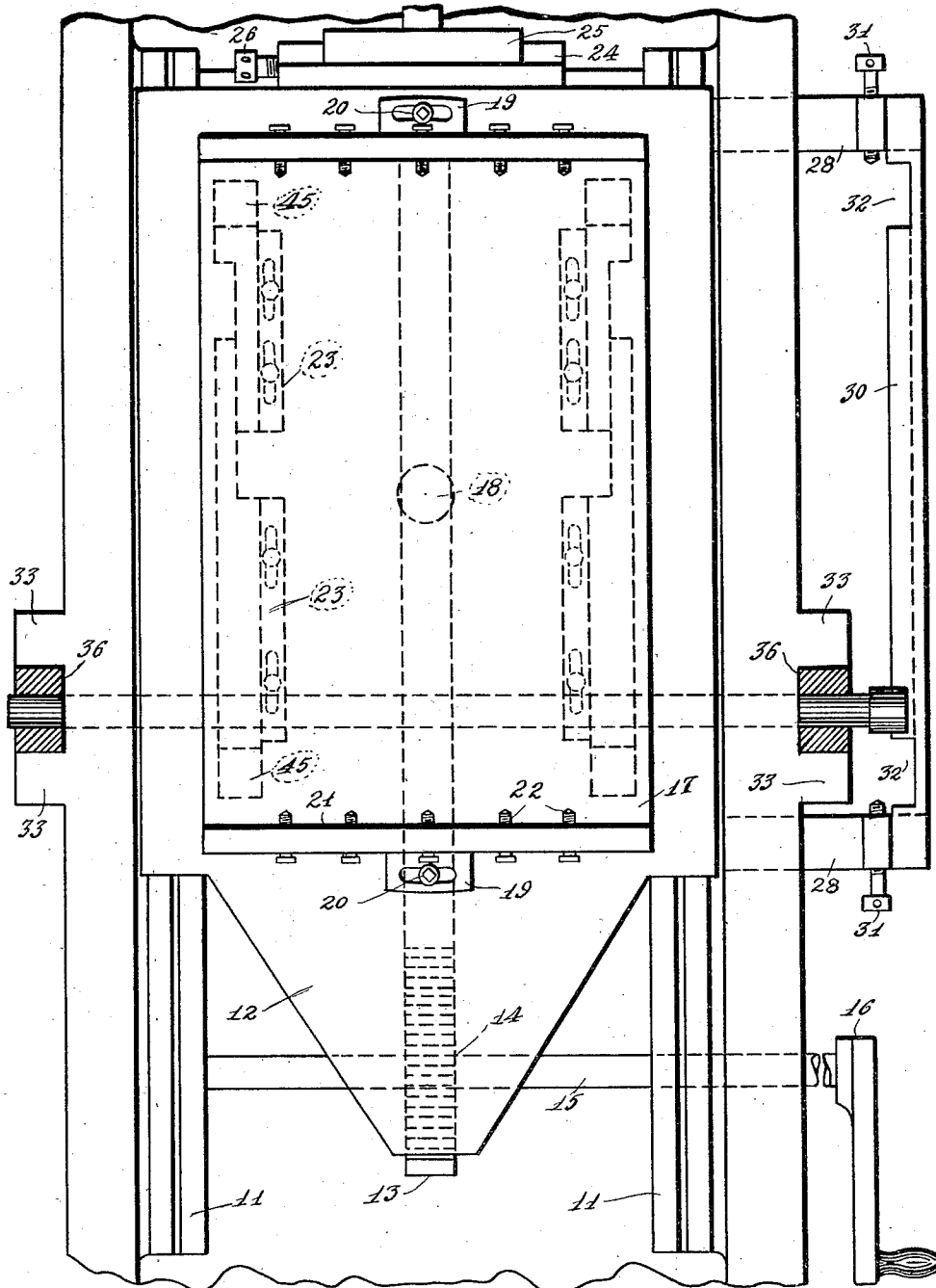
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5 SHEETS-SHEET 4.



WITNESSES:

Fig 5

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**1,065,951.**

5 SHEETS—SHEET 5.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

ROBERT MAGRANE, OF KINGSTON, PENNSYLVANIA.

IMPRESSING MECHANISM AND PROCESS.

1,065,951.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed October 13, 1910. Serial No. 586,873.

*To all whom it may concern:*

Be it known that I, ROBERT MAGRANE, a citizen of the United States of America, and a resident of Kingston, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Impressing Mechanisms and Processes, of which the following is a specification.

This invention relates generally to printing mechanisms and processes, and in particular to the production of metal rollers carrying designs for printing on fabrics or the like.

One object of the invention is to prepare a roller for etching processes by printing any desired design thereupon with an acid resist.

Another object is to provide means whereby when desired the roller may be stamped or cut with a design by the use of a suitable die, thereby directly forming a printing surface in relief of intaglio upon the roller without the use of either engraving or etching processes.

These objects and others are attained in a single mechanism herein described.

Referring to the drawings, in which like figures relate to corresponding parts, Figure 1 is an end elevation, partly in section, of the front side of the mechanism; Fig. 2 is a corresponding elevation of the rear side, the two figures fitting together; Fig. 3 is a side elevation of the frame, pedestal and linkage; Fig. 4 is a plan of the parts shown in Fig. 3; Fig. 5 is a plan of the frame and bed; Fig. 6 is a front elevation of the central portion of the machine; Fig. 7 is a detail of the eccentric construction, and Fig. 8 is a detail showing the locking sleeve.

The mechanism consists of three principal parts: the frame; the reciprocating bed and attachments longitudinally movable in the frame; and a sub-frame movable in a vertical plane above the reciprocating bed and carrying the roller.

*The frame and the bed.*—As shown in Figs. 1, 2 and 5, the frame 10 is equipped with inverted V guides 11, upon which the bed 12 is movable. On the under side of the bed is fitted a rack 13, which meshes with a pinion 14 (Fig. 6) upon a shaft 15, adapted to be rotated by the crank 16, or other suitable means. To the bed 12, the base 17 is swiveled as at 18, Fig. 5. The base is provided with slotted projections 19

by means of which it may be clamped to the bed 12 by the bolts 20 in any desired angular position. Upstanding lugs 21 with set-screws 22 form a part of the base and are the means by which the die or printing surface (not shown) may be attached to the bed. The reciprocatory mechanism also includes the arms 28, best shown in Figs. 1 and 5. These arms are attached to the under side of the bed 12 and project under one of the side frames of the machine. At the outer ends they carry the posts 29, to the tops of which the angle bar 30 is secured.

*The roller mechanism.*—This is carried by a framework constructed as follows: The main frame 10 is provided at its sides with squared ribs 33 which form guides for the movable upright standards 36. As shown in Figs. 1 and 6 the ribs 33 are connected by braces 34 and 35 to maintain the stiffness of the main frame. The standards 36, as shown in Figs. 1 and 2, are united at their lower ends by a heavy cross beam 37, the structure forming a single U-shaped frame adapted to be moved in a vertical direction. This frame is normally held in its upper position by springs located on each side of the frame, one of which is shown in Fig. 6. A boss 38 is secured to the standard 36 and the leaf spring 39 bears against its under side thereby raising the standard 36. The spring is clamped to a swivel 40 pivoted to the main frame at 41 and adapted to be rotated by screw 43 which is threaded in a lug 44 secured to the main frame.

The frame is moved downward by the following mechanism: A shaft 46 is mounted in the standards 36 and carries two eccentrics 48, equipped with friction rollers 47. The front end of the shaft carries a sleeve 50 in which are two pairs of slots 51 and 52, in which the angle bar 30 is adapted to slide. The sleeve also carries a tappet 53. Adapted to engage the eccentrics are a pair of cam blocks 23 adjustably mounted on the under side of the bed 12. These blocks have a taper at each end, and as the bed 12 reciprocates, they may engage the eccentrics on shaft 46, forcing the latter downward. The pressure upon the eccentrics and shaft is communicated by thrust blocks 49 directly to the cross beam 37. The engagement of the cam blocks 23 and the eccentrics 48 depends upon the angular position of the shaft 46. If the shaft 46 be partly rotated so that

the eccentric is displaced from a position vertically above the shaft, the cam blocks will not contact with the eccentric and the frame 37 will not be moved.

5 The means for moving the eccentrics are best shown in Figs. 1, 5 and 6. A screw 31 is mounted in each of the posts 29 carried by the reciprocating mechanism. As the bed approaches either of its limits of motion, the corresponding screw 31 will bear 10 against the tappet 53 attached to sleeve 50 on shaft 46. This will cause the shaft 46 to rotate sufficiently to throw the eccentrics either into or out of operative position. At this time 15 the cam blocks are not in an operative position and the shaft 46 is freely movable. As soon as the bed 12 starts its reverse movement, the angle bar 30 enters into one pair of slots in the sleeve 50, thereby locking the 20 sleeve and shaft 46 from further movement until the end of the stroke. The parts are so disposed that the shaft 46 is thus locked before the cam blocks begin to engage with or pass over the eccentrics. As shown in 25 Fig. 5 the angle bar 30 is provided with openings 32, 32 which register with the sleeve 50 at the moment the tappet 53 is engaged and moved by the screw 31, this arrangement allowing the shaft 46 to be rocked at the proper time, but keeping it normally 30 locked against movement.

The frame thus described carries the roller 70 upon which the design is to be printed or cut. This roller and its arbor 69 are 35 mounted on dead bearings, the construction of which is best shown in Figs. 1 and 2. The standards 36 carry heavy bearing slides 54 and 55 through which pass the stud shafts 65 and 66 which are held against rotation. 40 Each of these shafts has mounted on its inner end a stationary chuck 67 and 68 provided with jaws as shown and adapted to engage the arbor 69. The chuck jaws are ground concave and smooth to form adjustable bearings for the arbor. Motion is communicated to the roller by means of a two-tailed dog 71 clamped upon the arbor and 45 engaging two projections 72 which are bolted to a gear wheel 73. The gear wheel 73 is loosely mounted on the fixed stud shaft 65 and is driven by means to be described. It is understood the chuck jaws are set inward only far enough to form a suitable bearing for the arbor, and are never gripped thereto. 50 This mounting of the roller on dead bearings allows the attainment of greater precision in regard to all operations to be performed upon it. 55

The roller is rotated by mechanism shown 60 in Figs. 1, 4 and 6. The bearing slide 54 mounted in the standard 36, as shown in Figs. 1 and 6, carries two brackets 74 in which are formed squared socket bearings 75 for a rack 76 which meshes with and is 65 held in fixed alinement with the gear wheel

73. The movement of this rack causes the rotation of the roller by means previously described. As shown in Fig. 4, the outer end of the rack is attached by means of a swivel joint and slide 81 to a slotted lever 80 70 pivoted to the pedestal 79. This lever is attached to the reciprocating bed by means of a rod 27 which has a similar swivel joint and slide 78, 82 connecting it with the lever 80. The other end of the rod 27 is attached to a 75 slide 25 which is gibbed to a dovetailed plate 24 bolted to the reciprocating bed. A screw 26 provides means for adjusting the transverse position of the slide 25 upon the plate 24 and in consequent relation to the bed. 80 Two brackets 85 support a roller 86 which bears part of the weight of the rod 27 and lever 80.

In operation, as the bed is moved in one direction, a similar movement is communicated to the rack 76 to a lesser degree. The 85 pitch diameter of the gear wheel 73 is such, however, in its relation to this movement and the diameter of the roller 70, that normally the translatory speed of the bed and the peripheral velocity of the roller are equal. When it is desired to introduce a slip or varied motion between the bed and the roller, in order to produce a continuous and perfect pattern upon the roller in cases 90 where the longitudinal dimension of the flat pattern is not the same as the circumferential dimension of the roller, it is done by adjusting the screw 26, thereby moving slide 25 and rod 27. This movement changes the 95 point of application upon the lever 80 so that the movement of the rack 76 is accordingly accelerated or retarded corresponding to the direction in which the slide 25 is moved. 100

As shown in Fig. 3, the swivel joint 77 105 carried by the rack has an elongated bearing. This allows the rack to be moved vertically with the roller 70 and its frame as the roller is thrown into and out of operative position. 110

The mechanism thus far described is all that is necessary for the printing upon rollers with an acid resist for etching purposes. In operation, the printing surface is 115 placed upon the bed and adjusted. It is then inked with the resist and the pattern transferred to the roller by a reciprocation of the bed. The roller is then ready for etching. For the purpose of stamping or 120 cutting the roller with a die, however, additional mechanism is necessary, as the impression can best be secured by subjecting the roller to repeated engagements with the die. Referring to Fig. 6, the bearing slides 125 54 are supported by a stiff cushion of rubber 60. The cap 57 is threaded, and a splined screw 58 contacts with the top of the bearing slide. A worm wheel 59 surrounds the screw and engages the spline 130

thereof by means of a feather. The worm wheel is held in position by a double thrust block 61. A worm 62 engages the worm wheel and is mounted on a shaft 63. As shown in Fig. 1 the shaft 63 is equipped with a hand wheel 64. The movement of this shaft will force the bearing slides 54 and 55, shown in Figs. 1 and 2, downward, carrying with them the arbor and roller. In operation, the hardened die is fastened to the bed, the bed reciprocated and a light impression made upon the soft metal of the roller, which is preferably of copper. The roller is then lowered slightly by means of handwheel 64, and a second impression made. This process is repeated until the design is impressed upon the roller to the desired depth.

I claim:

1. In combination, a reciprocating bed, a roller having its axis mounted in a fixed vertical plane relative to the bed, and means to move said bed and to rotate said roller simultaneously at differential rates.

2. In combination, a roller, a reciprocating bed adapted to carry a die to make an impression upon said roller, and means to cause a differential movement of the roller and the bed during the making of an impression.

3. In combination, a roller, a reciprocating bed adapted to carry a die to make an impression upon said roller, means to cause a differential movement of the roller and the bed during the making of an impres-

sion, and means to vary the depth of the impression.

4. In combination, a roller, a reciprocating bed adapted to carry a die to make an impression upon said roller, means to cause a differential movement of the roller and bed during the making of an impression, and means to vary the effective distance between the roller and the bed.

5. In combination, a roller and a bed, one of which is adapted to carry a die to make an impression upon the other, means to bring the respective circular and plane surfaces into contact to transfer an impression, and means to cause a differential movement of the surfaces during the period of contact.

6. In combination, a roller and a bed, one of which is adapted to carry a design to be transferred to the other, means to bring the respective surfaces into contact to transfer the design, and means to cause a differential movement of the surfaces during the period of contact, including a lever having a fixed fulcrum.

7. The process of forming a printing roller, consisting in impressing a design thereon by a succession of rolling contacts with a die, and moving the contacting surfaces at differential velocities during the period of contact.

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Witnesses:

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L. J. BRIGGS.

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