

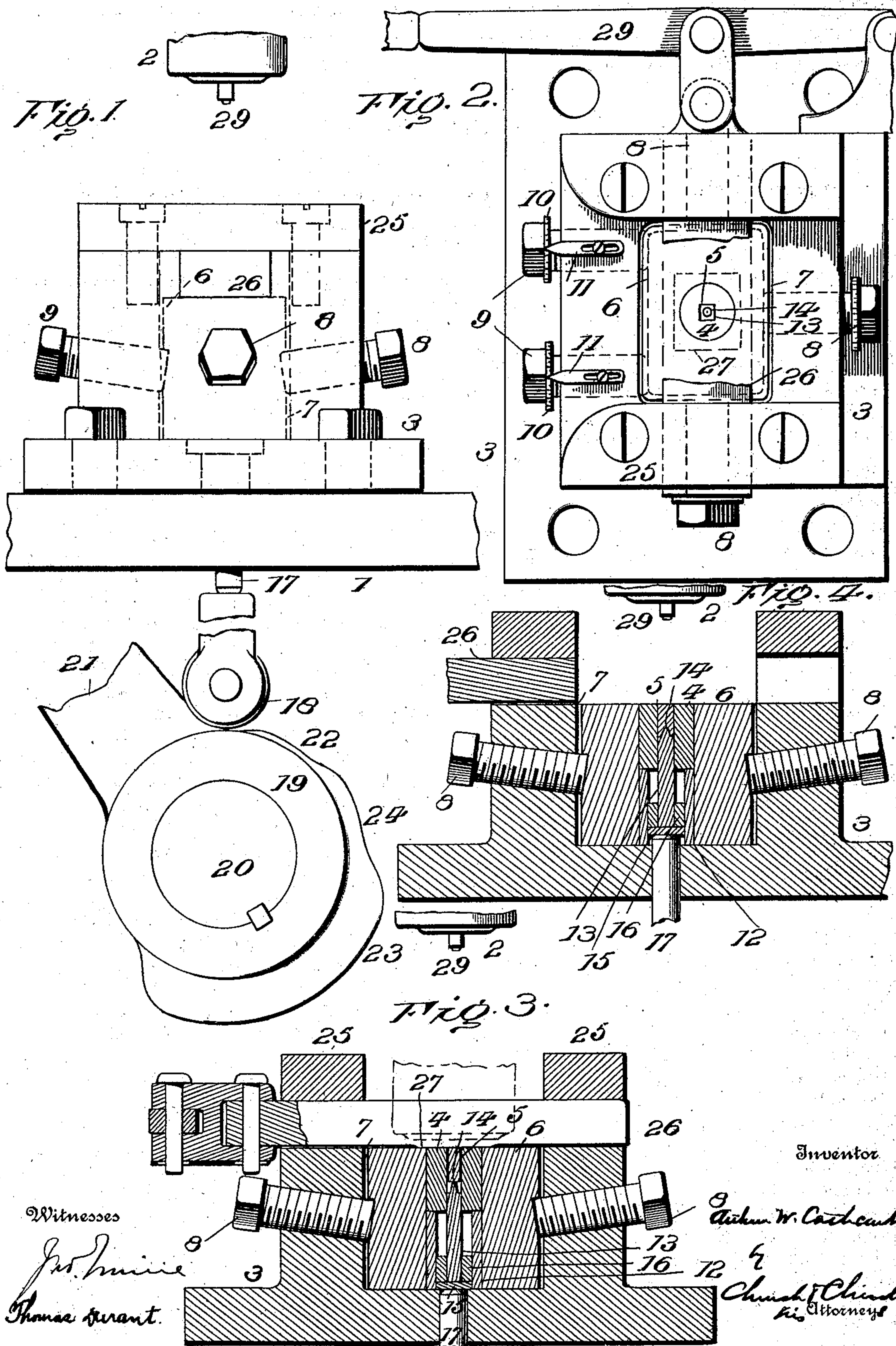
No. 700,301.

Patented May 20, 1902.

A. W. CATHCART.
DIE MECHANISM FOR MATRICES.

(Application filed Jan. 31, 1902.)

(No Model.)



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DIE MECHANISM FOR MATRICES.

SPECIFICATION forming part of Letters Patent No. 700,301, dated May 20, 1902.

Application filed January 31, 1902. Serial No. 92,063. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. CATHCART, of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Die Mechanism for Matrices; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures of reference marked thereon.

This invention relates to the manufacture of type-matrices and like articles, and comprises a new and improved die mechanism for shaping, gaging, condensing, and burnishing the blanks and forming the drive therein. Said mechanism is especially well adapted for use in practicing the method described and claimed in application Serial No. 76,361, filed September 24, 1901.

In the accompanying drawings, representing a preferred form of embodiment of said invention, Figure 1 is a side elevation, and Fig. 2 is a top plan view, of the die mechanism as applied to a power-press. Fig. 3 is a vertical section through the die as arranged for compressing and burnishing the blank. Fig. 4 is a similar view with burnishing-plate removed to uncover the end of blank preparatory to the formation of the drive.

Similar numerals in the several figures indicate the same parts.

The improved die mechanism is represented as applied to an ordinary power or stamping press, of which 1 designates the bed-plate or platen, and 2 the plunger. These may be of any approved form and construction; but preferably the press is one equipped with an automatic clutch device for arresting the plunger after each stroke.

Secured to the bed-plate opposite the plunger of the press is a block or plate 3, carrying the die 4, the latter furnished with a die cavity or recess 5, whose opposite walls are parallel, while its cross-section corresponds with that of the finished matrix. In the present instance die 4 consists of a cylindrical block of metal fitted in the upper end of a corresponding recess formed in a rectangular

block 6, the latter adjustably secured within an opening 7 in plate 3. This block 6 rests upon the bed-plate and is held securely in position by means of adjusting-screws 8 and 9. There are three screws 8, each engaging one side of block 6, and two screws 9 engaging the fourth side of the block, but on opposite sides of the center, by which means the die can be readily and accurately adjusted laterally in all directions and firmly held in position. To assist in retaining the die and its carrier in position, the adjusting-screws 8 and 9 penetrate the walls of the opening 7 in plate 3 at an angle, the inclination being downward toward the center, so that the thrust of the screws will tend to seat block 6 upon the bed-plate and resist vertical displacement. The heads of some or all of the screws 8 9 are provided with graduation-marks 10, coöperating with fixed pointers 11 for determining the position of the die with relation to the plunger of the press. For accurate work it is necessary that the die should be strongly supported and prevented from lateral displacement or springing. Hence the plate 3 and block 6 are made thick and heavy, and to facilitate manufacture and reduce the expense thereof the opening in block 6 is extended entirely through the latter, a tubular support 12 being inserted to sustain the relatively short die-block.

Fitted accurately within the die and forming the lower face or end of the die-cavity therein is a compression-plunger 13, whose end or face corresponds with that of the finished matrix. In the present instance the plunger is furnished with a conical projection or punch 14 for forming the centering-cavity in the end of the matrix. Plunger 13 rests upon disk 15, fitted to the interior of the die-support 12, and is held against lateral displacement by a sleeve 16, fitted to and working in said support 12.

Guided to reciprocate through bed-plate 1 in line with plunger 13 is an actuating-plunger 17, whose lower end carries a roller 18, in engagement with a cam 19, the latter carried by a shaft 20, to which a lever 21 is connected. This cam 19 is furnished with two gradi-

ents 22 and 23 and an intermediate concentric section 24.

Above the die 4 and mounted to reciprocate laterally thereof in guides 25 on plate 3 is a slide 26, formed or provided upon its under surface, or that next the die, with a burnished plate or surface 27. A lever 28 is connected to slide 26 for reciprocating the latter to alternately cover and uncover the upper end of the die-cavity.

The character-punch 29 is secured to and carried by the plunger 2 of the press.

The operation is as follows: The die 4 is first adjusted to bring its cavity into proper relation with punch 29 to justify the drive, slide 26 is retracted to uncover the die, and plunger 17 is likewise withdrawn, so that plunger 13 may be retracted to the full extent permitted. A blank, preferably of copper or an alloy thereof, slightly longer and less in cross-section than the finished matrix is inserted in the die, after which slide 26 is advanced to position above the die. By means of lever 21 or equivalent actuating mechanism a partial rotation of cam 19 is effected sufficient in extent to cause the first or lower gradient 22 to advance plungers 17 and 13, thereby forcing the blank against slide 26, driving in punch 14, condensing the metal of the blank, and causing the latter to assume the shape and dimensions of the die-cavity. As an incident to the powerful pressure exerted such an elastic tension is induced that if while the plunger 13 is retained in position by the concentric section 24 of the cam slide 26 is forcibly withdrawn it will act as a burnisher to smooth and polish the face of the blank, and thus prepare it in the most favorable condition for receiving the drive, which latter operation is performed after slide 26 has been withdrawn and while the blank is still retained in position in the die by causing a reciprocation of plunger 2, thereby sinking the character-punch into the polished surface and to a depth determined by the throw of plunger 2. The drive having been completed, a further movement of cam 19 operates through gradient 23 to again advance plunger 13 and eject the matrix from the die.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a die mechanism such as described, the combination with a die and a compression-plunger, of a movable planishing-surface forming one wall of the die-cavity; as set forth.

2. In a die mechanism such as described, the combination of a die, a compression-plunger and an opposing laterally-movable abutment or slide acting both as a wall of the die-

cavity and a planishing medium for the face of the blank, substantially as described.

3. In a die mechanism such as described, the combination with the die and compression-plunger of a movable slide closing one end of the die and an impressing punch or plunger, substantially as described.

4. In a die mechanism such as described, the combination with the plunger and platen of a power-press, of a die supported on the platen and adjustable laterally of the plunger, a compression-plunger fitted to and working in one end of said die, a plate or cover for the opposite end of the die movable transversely of the latter, and a character-punch secured to the press-plunger in line with the die; substantially as described.

5. In a die mechanism such as described, the combination of the perforated die-block, the die located in one end thereof, the tubular support, the compression-plunger, the plunger-supporting sleeve and the disk engaging the rear end of said compression-plunger; substantially as described.

6. In a die mechanism such as described and in combination with the die, its compression-plunger and the opposing abutment or plate closing one end of the die, of a plunger-actuating mechanism adapted to effect successive advance movements of the plunger for first compressing and then ejecting the blank; substantially as described.

7. In a die mechanism such as described, the combination of the following elements, to wit: a stationary die; a character-punch in alinement with the opening in said die, a slide movable laterally of the die intermediate the latter and the character-punch, said slide forming one wall of the die-cavity, a compression-plunger movable within the die opposite said slide; and actuating mechanism competent to advance the compression-plunger and reciprocate the slide; substantially as described.

8. In a die mechanism such as described, the combination of the following elements, to wit: a stationary die; a slide closing one end of said die; a compression-plunger in alinement with the opening in the opposite end of the die; and a cam connected through transmitting devices to said compression-plunger, said cam being provided with two gradients of progressively increased prominence separated by a concentric section to produce a dwell between successive advance movements of the plunger; substantially as described.

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