

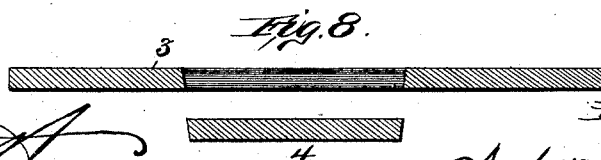
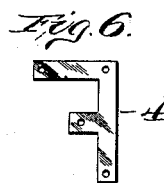
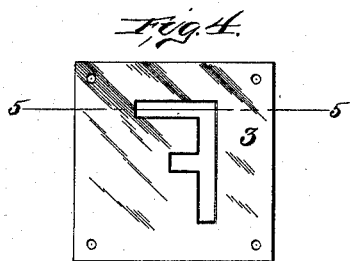
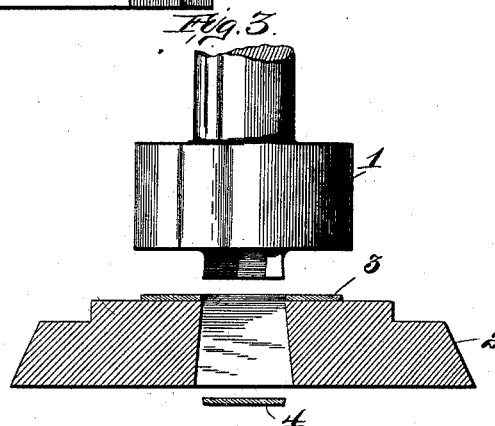
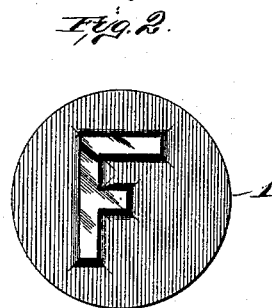
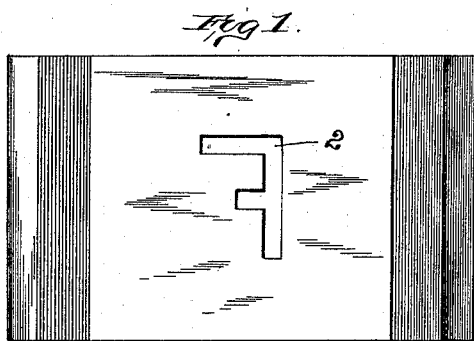
(No Model.)

2 Sheets—Sheet 1.

A. J. BRADLEY.  
DIE AND PROCESS OF MAKING DIES.

No. 522,953.

Patented July 10, 1894.



Attest:  
*James A. Carr*

Inventor:  
*Andrew J. Bradley*

(No Model.)

2 Sheets—Sheet 2.

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Fig. 9.

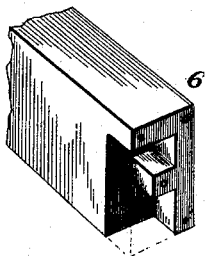


Fig. 10.

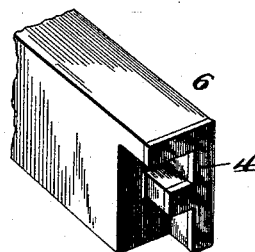


Fig. 11.

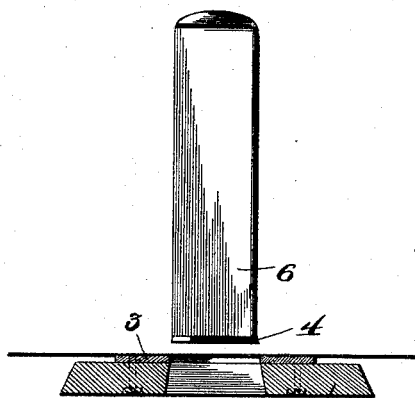


Fig. 12.



Fig. 13.

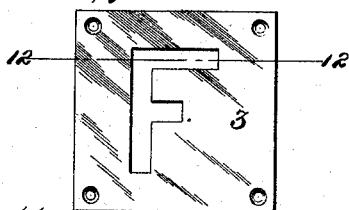


Fig. 14.



Fig. 15.



Attest:  
*Wm. H. A.*  
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Inventor:  
Andrew J. Bradley

# UNITED STATES PATENT OFFICE.

ANDREW J. BRADLEY, OF ST. LOUIS, MISSOURI.

## DIE AND PROCESS OF MAKING DIES.

SPECIFICATION forming part of Letters Patent No. 522,953, dated July 10, 1894.

Application filed October 26, 1892. Serial No. 450,030. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. BRADLEY, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Die and a Process of Making Dies, of which the following is a specification.

My invention relates to dies, especially to a process for punching thin blanks, and also to a process of making such dies.

The principal objects of my invention are to lessen the labor and material involved in the manufacture of dies and to produce a new article at less cost than dies of the kind now in use can be made; and my invention consists in the process and in the article herein-after described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of an ordinary female die. Fig. 2 is an inverted end view of the ordinary male die or punch corresponding to the die of Fig. 1. Fig. 3 is a vertical section of the ordinary female die with its punch shown in elevation, and a punched blank shown in position. Fig. 4 is a plan of the blank after it has been punched by the die shown in Figs. 1, 2, and 3. Fig. 5 is a section thereof. Fig. 6 is a plan of the portion punched out of such blank; and Fig. 7 is an end view thereof. Fig. 8 is an enlarged sectional view of the blank and its cut out portion. Fig. 9 is a perspective view of a shank upon which the cut out portion of the blank is to be mounted. Fig. 10 is a perspective view of the new punch. Fig. 11 is an elevation of the complete article, showing the female die in section and a blank in position to be punched. Figs. 12, 13, 14, and 15 are inverted views of Figs. 5, 4, 7 and 6, respectively.

My invention is based on the idea of utilizing sheets or blanks of metal, of a thickness adapted to be punched with dies of the ordinary kind, by suitably mounting both the punched blank and the punched out portion thereof to serve as the female die and the punch respectively of the new die. I have observed as a physical fact that the edge of a hole in a metallic blank made by a punch is very slightly beveled or rounded off at the surface which the punch strikes first, while the edge at the under surface is sharp. The

width of the opening on the outer surface is very slightly more than the width at the under surface. On the other hand, the width of the punched out portion is greater and its edge is sharper at the outer surface than at the under surface. A die with a round edge, such as would be formed by directly mounting the punched blank and the punched out portion, is practically worthless; but by inverting both the punched blank and the punched out portion, and then mounting them, the wider side of the punched out portion, which also has the sharp edge, forms the end or face of the new punch, and the side of the blank on which the opening is narrower and sharper, forms the face of the new female die. The new die thus formed is the reverse of the die which formed it.

In carrying out my process, therefore, a die, consisting of a punch, 1, and a female die, 2, is made in any suitable way, but its pattern is the reverse of that of the die to be formed. Blanks or sheets of iron or steel of suitable thickness are punched with this die. I have found steel blanks of a thickness of one-sixteenth of an inch suitable for dies for stencil machines. As shown in the drawings, the die to be made is of a pattern to cut the letter, F. the original die, 1, 2, punches the blank as shown at 3, the upper edge of the opening being beveled or flared. The punched out portion, shown at 4, has its upper edge wider and sharper than its lower.

The punched blank is mounted on a suitable base or block 5, with its sharp edge outermost and its round edge next to the block. Any convenient means of fastening the blank to the block may be used, but I prefer to screw it to the block. The block is mainly for the purpose of providing a backing for the punched blank which forms the face of the die, so as to prevent bending and to keep the edge of the die in place. There should be an opening through the die block corresponding in size and shape to the opening through the ordinary die, to allow the punched out material to pass through.

The punched out portion, 4, of the blank is mounted on a shank, 6, provided therefor. This shank is preferably of soft metal but it may be cast or otherwise cheaply formed of any suitable material, with its end portion

approximately of the desired shape for mounting the punched out portion. The end of the shank is, preferably, beveled off or inclined so as to give its face plate an inclination to the die and thereby constitute a shear, as in the common die. The punched out portion is secured to the shank, preferably, with solder and screws, and with that surface exposed which the original punch struck. The punched out portion thus mounted constitutes the new punch. The meeting edges of the new punch and the new die are sharp but ordinarily a slight burr or feather-edge is made by the punch, which is easily removed with a file. Very little work is required to finish and dress up the parts so that they will fit exactly.

It is noted that the face-plates both of the punch and of the die are completely formed by the simple process of punching, so that they are immediately in condition to be mounted.

The dies thus formed are specially adapted for stencil cutters and other devices which punch thin blanks. Instead of forming each die by hand, as is now the practice, in making dies for such machines, only one hand-made die is necessary for each pattern and from this one, any number of others may be formed, and they will be interchangeable. It is necessary in such machines to provide for stays in the blanks to be cut in the formation of certain characters; but as such provision is common in the art and requires only a simple and obvious modification of the pattern of the original die, I have thought best to illustrate a more simple pattern. Obviously, when the original die punches out several pieces instead of a single piece, the several pieces must be so mounted on a single shank as together to fit the pattern, punched in the blank, when the blank is reversed.

The principal advantages of my process are its economy of labor and material.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of making dies consisting of

punching a metallic blank, reversing both the punched blank and the punched out portion, and mounting them in such reversed position, substantially as described.

2. The process of making dies which consists of punching a metallic blank and mounting said punched blank so that the surface thereof which the punch struck first rests against the part on which said blank is mounted, substantially as described.

3. The process of making die punches which consists of punching a blank and mounting the punched out portion on a shank with the surface thereof, which the punch struck, exposed, substantially as described.

4. The process of making dies which consists of punching a blank, mounting said punched blank with the surface thereof, which the punch struck, first against the part on which said punched blank is mounted, and mounting the punched portion, with the surface thereof, which the punch struck, exposed, substantially as described.

5. A die consisting of a base-block and a punched sheet metal face plate, said face plate being mounted so that the surface thereof which the punch struck, is next to said base-block, substantially as described.

6. A punch consisting of a shank and a punched face plate, said face plate being mounted on said shank with the surface thereof, which the punch struck, exposed, substantially as described.

7. The combination of a die consisting of a base-block having a punched face plate mounted thereon with the surface, which the punch struck, against said block, and a punch consisting of a shank having a face plate mounted thereon, said last mentioned face plate being punched out of a metal blank and mounted with the side, which the punch struck, exposed, substantially as described.

ANDREW J. BRADLEY.

Witnesses:

D. IND. NEUDORF,  
JAMES A. CARR.