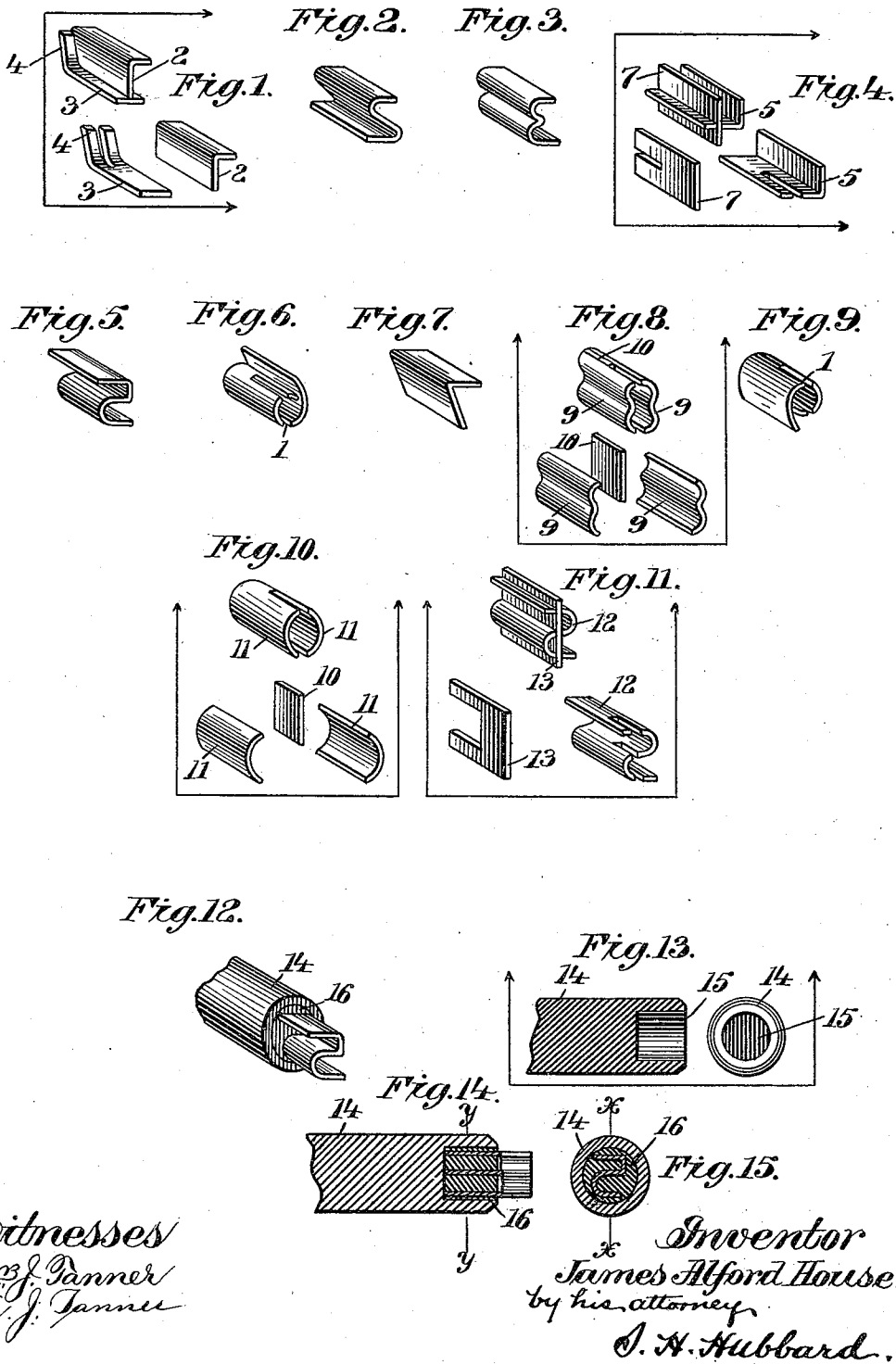


(Model.)

J. A. HOUSE.
PUNCH AND METHOD OF MAKING THE SAME.

No. 430,315.

Patented June 17, 1890.



UNITED STATES PATENT OFFICE.

JAMES ALFORD HOUSE, OF BRIDGEPORT, CONNECTICUT.

PUNCH AND METHOD OF MAKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 430,315, dated June 17, 1890.

Application filed April 7, 1890. Serial No. 346,848. (Model.)

To all whom it may concern:

Be it known that I, JAMES ALFORD HOUSE, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Punches and Method of Making the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain novel and useful improvements in punches and the method of making and mounting the same; and the object of my invention is to greatly simplify and cheapen the construction and at the same time to provide a punch of great efficiency and wearing capacity, and, furthermore, to arrange for the mounting and adjustment of the punch, as will be hereinafter explained.

Heretofore it has been usual in the production of punches for use in combination with a die to form a cutting-face upon the end of a metal rod, either by milling, swaging, or drifting, said rod serving as the shank of the punch; and it is the primary object of my invention to form punches which shall be highly efficient without resorting to these methods or either of them, and which, without deterioration of quality, shall be exceedingly cheap to manufacture.

My invention, furthermore, has for its object to mount the punches made in accordance with my method upon a shank in a simple and inexpensive manner to adjust the punch in proper alignment with its die simultaneously with the mounting of said punch on the shank, and likewise in the case of punches made of a plurality of pieces to secure said pieces together as well as to the shank; and with these ends in view my invention consists in the construction hereinafter to be fully and in detail explained, and in the method of production and mounting presently to be set forth, and then recited in the claims.

In order that those skilled in the art to which my invention appertains may fully understand both the construction and the meth-

ods wherein the same consists, I will proceed fully and at length to explain them, referring by letter to the accompanying drawings, which form a part of this specification, and in which I have shown a set of punch-faces adapted, when properly mounted, to be used in combination with proper co-operating dies in a machine for punching characters out of paper—such, for instance, as the check-punches commonly used.

Figure 1 represents in perspective a punch adapted to cut the character 1 when mounted on a suitable shank and operating in conjunction with a properly-shaped die. Said figure also shows the two parts of said punch separated. Fig. 2 is a perspective view of a punch for the character 2; Fig. 3, a perspective view of a punch for the character 3; Fig. 4, perspectives of the 4-punch and the separate parts forming the same; Figs. 5, 6, 7, 9, perspectives of the punches for the characters 5, 6, 7, 9; Fig. 8, perspectives of the 8-punch and the parts thereof; Fig. 10, a similar view of the 0-punch; Fig. 11, a like view of the punch for the dollar-sign; Fig. 12, a perspective of a punch mounted upon a shank; Fig. 13, a detail vertical section and a face view of a shank previous to the insertion of the punch, and Fig. 14 a longitudinal vertical section through a finished punch. (See line *xx* of Fig. 15.) Fig. 15 is a transverse vertical section at line *yy* of Fig. 14.

Like numerals denote the same parts in all the figures of the drawings.

The basis of my invention is the drawing or bending of a piece of metal into such shape that its cross-section shall represent in reverse the character desired to be cut.

Of the characters shown in the drawings, the 2, the 3, the 5, and the 7 represent the simplest forms of my invention, since the punches for these may be drawn through a die after the manner of a wire or rolled after the manner of angle-iron to the exact shape in which each of them is shown, it being optional whether each punch shall be separately formed of the proper length or whether a strip of considerable length representing in cross-section the character desired be drawn or rolled and then severed to the proper size. This method is so obvious from the figures

referred to that I have thought it unnecessary to use any reference-letters upon them, and likewise it has seemed needless to exhibit dies capable of producing them.

5 The next class of figures is represented by the 6 and 9 punches, which are drawn or rolled to shape in all respects like the punches heretofore described, except that it is necessary, after the punch has been so rolled or
10 drawn, to slot its face vertically, as seen at 1, Figs. 6 and 9, so that said punch shall not cut out a hole from the paper corresponding to its peripheral outline, but shall leave a center of paper to complete the character.
15 Above these in complexity are the punches for the characters 1, 4, 8, 0, and the \$. While some of these—for instance, the 1 and 4—might possibly be drawn integral, such a method would be more difficult and expensive
20 than the combining together of two or more pieces, as is my preferred construction.

The 1 consists of an angle-bar 2, having a strip 3, whose rear end is inclined upward, as at 4, and is slotted to be set astride the body
25 of the angle-bar. These two parts may be secured together, as by brazing, but the assembling method, presently to be described, renders it practically unnecessary.

The 4 consists of an angle-bar 5, one of whose faces is slotted for substantially half its length, as seen at 6, and a straight section or plate 7, slotted, as seen at 8. By sliding the slots together the two parts rest astride each other, as seen at the figure, and are securely held as against displacement, as will be hereinafter set forth.
35

The 8 is preferably of two doubly-curved parts 9, forming the sides of the figure, said plates being separated by a thin block 10 for the purpose of accomplishing the result hereinbefore set forth in connection with the slotting of the faces of the 6 and 9.
40

The 0 I preferably make in the same manner as the 8, parenthetically formed, cutting parts 11 being separated by a block 10.
45

I have referred to the 8 and 0 as preferably made each in three pieces; but they may be made integral by bending, and their faces then slotted after the manner of the 6, if such method should be found advantageous for any reason.
50

The \$ most nearly resembles the 4 and consists of a reversed S-shaped plate 12, slotted vertically, as seen in the detail thereof shown at Fig. 11, and having the slotted vertical cutting-bar 13 inserted therein to complete the character, the slot of each part being astride the metal of the other.
55

Having described the construction of the punches, I will now explain the method of assembling and holding them in the shanks.
60

I prefer to take a shank 14, having a socket 15 in the end thereof, and after placing one of the punches in said socket to secure it there by filling the socket with molten metal, which incloses the punch and prevents its withdrawal from the socket, and likewise
65

when the punch is made of two or more pieces retains said pieces in their proper relative position. The poured metal is represented 70 in the sectional views by 16. The socket may be and preferably is slightly expanded or flaring from the mouth upward; if desired, to insure the holding of the parts.

In assembling punches of the character described, so that they will accurately enter the dies of an organized punching-machine, I find it advantageous to pursue the following method: The dies are first placed in position and the punch-shanks arranged in their guide-ways. The punch is then pushed into the die and the socket of the shank brought down upon the punch, so that the latter enters the socket to its full depth. The parts are then turned so that the socket will have its mouth 85 upward, and metal is then poured in around the punch and allowed to cool. When cool, the punch on the shank may be withdrawn, and said punch will thereafter be in proper alignment relative to the die. It will be observed that in this way a very accurate adjustment is necessarily obtained, while at the same time great care need not be exercised in the formation and assembly of the parts of the machine which hold the die and afford a 95 bearing for the punch.

A modification of the method just described may be practiced by introducing into the socket around the punch a fusible metal in granular or comminuted form and then fusing said metal by the application of heat, as by a blow-pipe. Punches made in this way are of uniform cross-section throughout, and may therefore be beveled in any desired manner to make their cutting action a shear cut.
100 105

In this my invention I do not wish to be limited to the manufacture of the specific characters shown in the drawings, since these are merely illustrative of the capabilities of my improved method, which is applicable to the manufacture of cutting-punches representing a wide diversity of letters and figures. Furthermore, I do not wish to be understood as confining myself to the constructions shown in the punches composed of a plurality of parts, since these may be varied and differently combined without departing from the spirit and aim of my invention, which I deem commensurate with the language of the claims.
110 115 120

I claim—

1. A punch adapted for use in combination with a die, the same consisting of a bent or folded sheet-metal cutting-face, a socketed shank, and an interposed filling of metal, whereby said punch and shank are retained in their assembled position, substantially as specified.
120 125

2. A punch adapted for use in combination with a die, said punch consisting of a folded or drawn sheet-metal portion adapted to enter the die, a shank having a socket flaring upwardly from its mouth and adapted to contain the upper end of the cutting portion, and a filling of fusible metal surrounding the cut-
130

ting portion and holding the latter in proper position relative to the shank, substantially as set forth.

3. The method of making punches adapted for use in combination with a co-operating die, the same consisting in drawing or folding a strip of sheet metal into such form that its end and its cross-section represent the desired character, substantially as set forth.

4. The method of making punches of the character described, which consists in taking a strip of metal of uniform thickness, said thickness being identical with the width of the opening desired to be cut, and then bending or folding said metal so that its cross-section corresponds to the character to be produced, substantially as set forth.

5. The method of producing punches of the character described, which consists in drawing from sheet metal a strip having a cross-section representing the character to be punched, inserting said strip within a suitable socketed shank, and then introducing into said shank and around the punch a filling of fused metal, substantially as described.

6. The method of making punches of the

character described, which consists in taking two or more sections of sheet metal and arranging them so that together they make up the desired character, inserting said sections in assembled position within a hollow shank, and then introducing within the socket a filling of fused metal, whereby the several parts are retained in proper relative position both to the shank and to each other, substantially as described.

7. The method of making punches for use in connection with co-operating dies, and likewise of aligning said punches relative to said dies, which consists in first forming the punch, then inserting said punch into the die, then placing a socketed shank over the punch while the latter is held in the die, and finally pouring fused metal into the socket around the punch, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES ALFORD HOUSE.

Witnesses:

S. H. HUBBARD,

M. C. HINCHCLIFFE.