(No Model.)

M. KENNEDY.

DIE PUNCH FOR MAKING TURN BUCKLES.

No. 444,595. Patented Jan. 13, 1891.

Fig. 1.

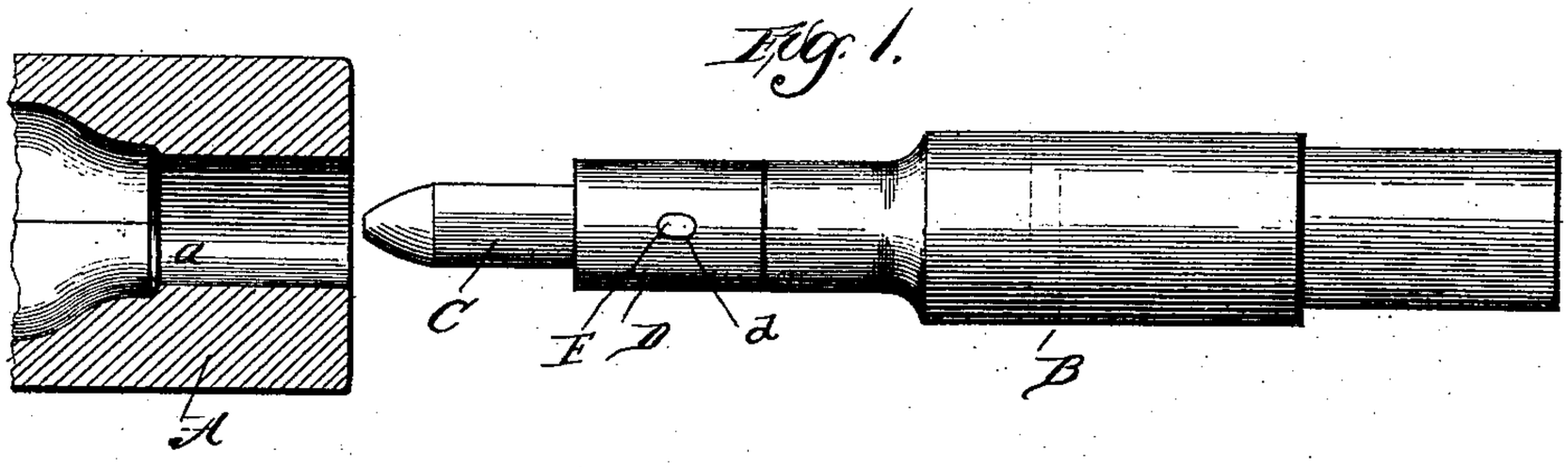


Fig. 2.

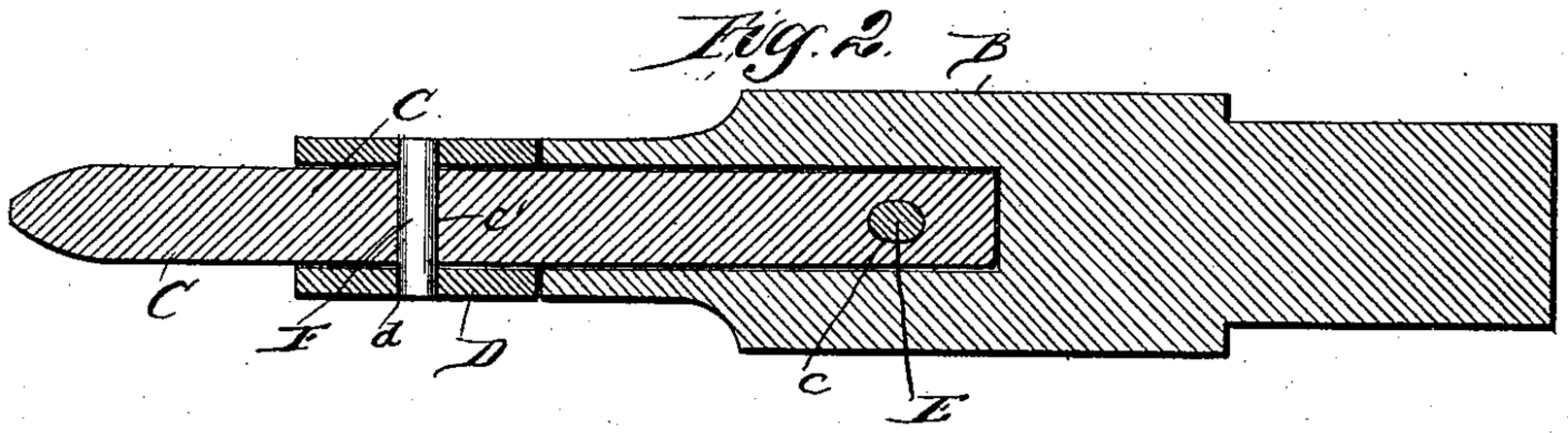


Fig. 3.

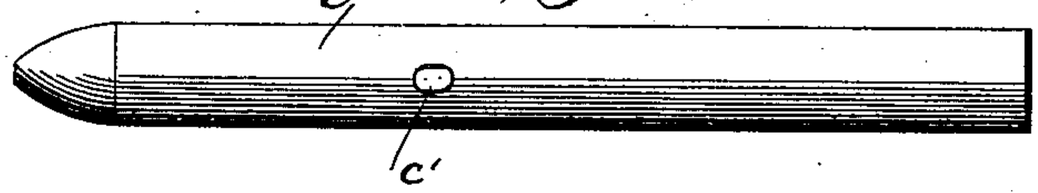


Fig. 5.

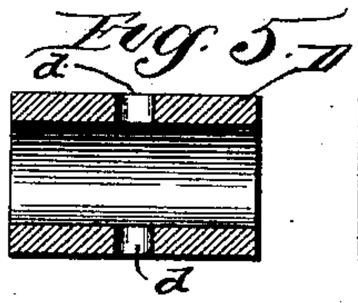
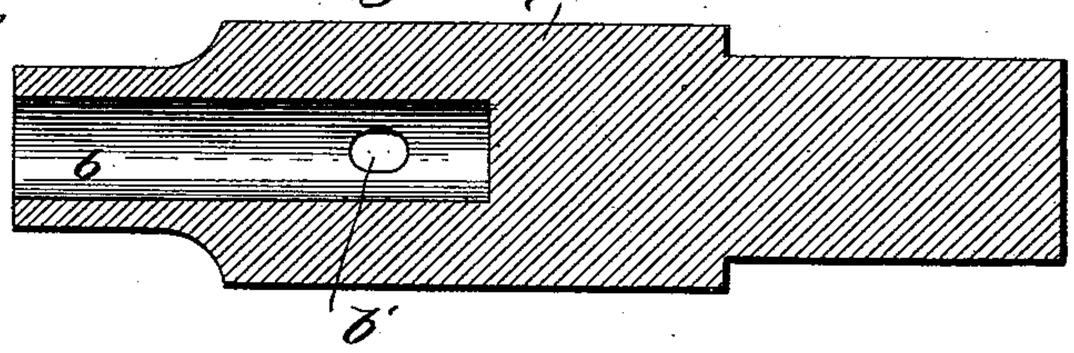


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DIE-PUNCH FOR MAKING TURN-BUCKLES.

SPECIFICATION forming part of Letters Patent No. 444,595, dated January 13, 1891.

Application filed March 17, 1890. Serial No. 344,108. (No model.)

To all whom it may concern:

Be it known that I, MARTIN KENNEDY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Die-Punches for Making Turn-Buckles, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a punch embodying my invention and a portion of a die-section; Fig. 2, a longitudinal section of the punch; Fig. 3, a side elevation of the removable end of the punch detached; Fig. 4, a longitudinal section of the stock portion of the punch detached, and Fig. 5 a similar section of the detachable collar. Fig. 1 is on a scale by itself, and the remaining figures upon the same scale, but enlarged from that of Fig. 1.

My invention relates to a punch which is intended for use in the manufacture of turn-buckles as described in Letters Patent No. 395,281 granted to me December 25, 1888, and in connection with inclosing dies as set forth in said patent, or as set forth in my application, Serial No. 338,182, filed January 27, 1890. In the manufacture of turn-buckles in the manner referred to two bars having their ends bent in a particular way are placed in inclosing dies and the heads of the turn-buckle are formed by upsetting the ends of these bars within the dies by a suitable punch entering the end of the latter. The die is provided with a central core, which is bored or hollow for the purpose of receiving the small tip of the punch as it is driven in between the ends of the two bars to upset the latter to form the head of the turn-buckle, and at the same time providing the required central opening in this end by upsetting the metal around the end of the punch. In this operation great force is exerted upon the dies and punch and the latter is subjected to very severe strain as it is driven inward with the force required to do the work. I have found that if the punch is made in one piece, as is usual for similar operations, it is very liable to break at the tip end. A slight deviation from a direct line in entering the die, together with the unequal distribution of resistance around the punch as it is driven forward into the die, is almost sure to break the punch.

The present invention is intended to obviate this difficulty; and it consists in making the punch in separate pieces, whereby provision is made for slight relative movement, which will relieve the unequal strains upon the punch and prevent breakage.

I will proceed to describe in detail the construction of a punch in which I have embodied my invention in a practical way, and will then point out definitely in claims the improvements which I believe to be new and wish to protect by Letters Patent.

In the drawings, A represents a small section of a two-part inclosing die, sufficient thereof being shown for the purpose of illustrating the operation of the punch in connection therewith, and the die being shown of the construction specified in my above-mentioned application. The central core of this die is indicated by *a* and is hollow, as seen in the drawings. The punch is composed of three separate parts—namely, a stock or body B, a stem or tip C, and a collar D. The stock B is of circular form, the middle portion being larger than the ends, the front end being turned down to the size of the opening in the end of the die, and the other end reduced slightly to adapt it for fitting to the plunger or punch-holder, by which it is reciprocated. This piece is also bored in centrally from the front end some distance, so as to provide a circular socket *b*, and near the inner end or bottom of this socket small apertures *b'* are cut through the walls, being arranged directly opposite each other. This socket in the stock is adapted to receive the stem or tip C with an easy fit, the size of the latter being of course determined by the central opening in the core of the die, which it is to enter as the punch is driven forward. Near the end of the stem which enters the socket a hole *c* is cut to correspond with the openings *b'* in the stock, and the stem is secured in its socket by inserting a pin E through these several openings. As shown in the drawings, the stem is made to project from the stock considerably more than is necessary, which

is for the purpose of accommodating the short collar or sleeve D, which is constructed to fit loosely upon the stem in front of the stock, and is of such size as to be flush with this end of the stock when placed upon the stem, as seen in Figs. 1 and 2 of the drawings. Two apertures *d* are made in this collar arranged directly opposite each other, and a hole *c'* is cut through the stem to correspond with these openings, thereby providing means for fastening the collar upon the stem by a pin F, which is passed through these several apertures. The collar is of such length as to leave a sufficient portion of the stem projecting therefrom to enter the die-core a suitable distance to give a firm support and bearing for the stem, while the head of the turn-buckle is formed around it. It is obvious that the diameter of the collar corresponds to the required diameter of the opening in the end of the die.

It will be understood that in operation the punch is driven forward into the die, and the collar coming in contact with the ends of the bars the latter will be upset by the inward movement of the punch, thereby forming the head between the collar and the core of the die and around the stem of the punch which has entered the opening in the core. On account of the construction of the punch in separate pieces and the fitting of said pieces together, as described, there is a slight yielding of the stem in its socket, and also a similar very slight movement of the collar on the stem. This slight play of the parts relatively is sufficient to counteract any slight variation from a direct line in the movement of the punch, and also the effect of inequality of pressure on different sides, so that the danger of breaking the stem is practically obviated. This result is accomplished to some extent without the collar, the stem being set in the stock, as described above, and the proportions of these two parts being correspondingly changed; but I have found by actual experience that this construction does not entirely relieve the difficulty, and that there will still be frequent breakage, although not to the same extent as when the punch is made in one entire piece. The application of the collar seems to provide an additional relief by a kind of differentiation of the yielding movement which reduces the probability of breakage almost to zero. It will be seen also that the parts of the punch are readily separable from each other by simply pushing out the fastening-pins E and F, and are connected to each other in working position with equal facility. The collar is also reversible, so that it may be changed when one end is broken down, and the punch will therefore last nearly twice as long as though solid. I wish to be understood, however, as including in my invention the punch when made in two parts—that is, the stock and the stem socketed therein, as described, but without the collar—and also as the preferable construction the punch composed of the said two parts with the addition of the loose collar, as described.

In some details, such as the fastening devices and other like features, changes may be made without departing from the principle of my invention.

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

1. In a die-punch for forging turn-buckles, a body or stock B, provided with a punching-stem, in combination with the independent loose collar surrounding the stem just in front of the stock, substantially as and for the purposes specified.

2. In a die-punch for forging turn-buckles, a stock B, in combination with an independent stem C, socketed in said stock, and an independent sleeve or collar D, applied to the stem in front of the stock, substantially as and for the purposes specified.

3. In a die-punch for forging turn-buckles, the stock B, provided with the socket *b*, in combination with the stem C, fitted to said socket, the loose collar D, applied to the stem, and the fastening-pins E and F, substantially as and for the purposes specified.

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