June 14, 1949. A. A. REMBOLD 2,473,073

PUNCH

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Fig. 1.

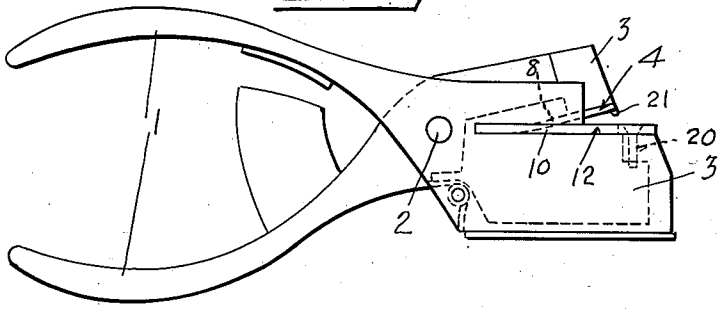



Fig. 2.

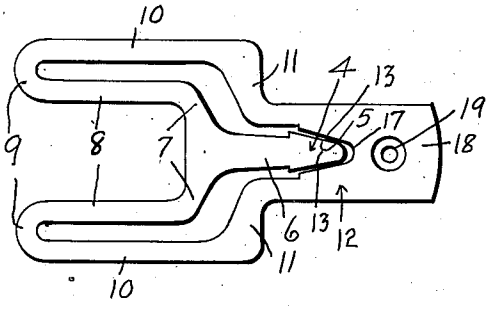



Fig. 3.

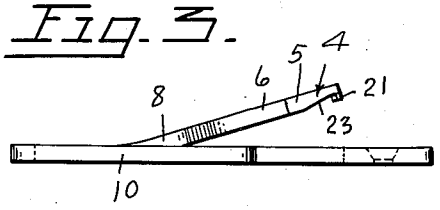
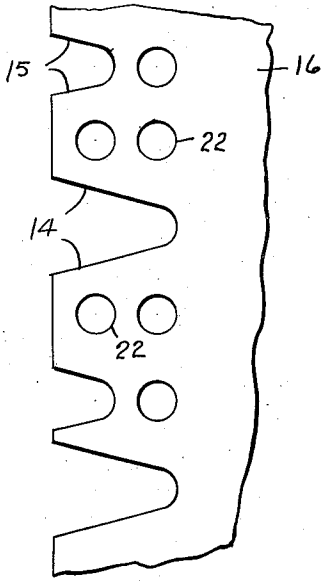



Fig. 4.




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## PUNCH

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Application February 1, 1947, Serial No. 725,864

3 Claims. (Cl. 164—120)

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This invention relates to a card punch of generally the same type disclosed in my United States Letters Patent No. 2,404,985 of July 30, 1946.

One of the objects of this invention is the provision of a punch comprising an integrally formed punch and die member that is less susceptible to breakage under continuous hard usage than heretofore.

Another object of the invention is the provision of a punch comprising an integrally formed punch and die member that is adapted for slotting out cards to one edge thereof, and which punch is more flexible than heretofore and in which there is a better distribution of spring force and power.

Other objects and advantages will appear in the description and in the drawings.

In the drawings,

Fig. 1 is a side elevational view of a plier-type carrier for the punch elements of this invention.

Fig. 2 is an enlarged plan view of the invention.

Fig. 3 is a side edge view of the device of Fig. 2.

Fig. 4 illustrates an edge of a card slotted out by the punch elements of Figs. 2, 3.

In detail, the plier type of carrier for the punch and died members shown in Figs. 1, 2 comprise a pair of handles 1 pivotally connected at 2 for swinging of the jaws 3 toward and away from each other upon similar movement of the handles. The integrally connected punch and die member of Fig. 3 is adapted to be carried between the jaws for movement of the punch member into the die member upon manipulation of the handles 1 toward each other and consequent movement of the jaws 3 toward each other.

This plier type of carrier is merely illustrative of one means for moving the punch member into the die member for punching out a slot in the edge of a card adapted to be positioned between said members, and was fully described in my above mentioned patent.

Referring more particularly to Figs. 2, 3 the punch member 4 may be of any desired outline, although herein it is shown as having divergently extending sides 5 and a rounded point connecting said sides at their convergent ends. A neck 6 extends from the wide end of the punch member between the divergent ends of said sides 5, and which neck terminates in oppositely outwardly extending shoulder 7.

A pair of parallel spaced spring arms 8 extend from said shoulders in a direction away from said neck 6.

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The outer ends of said spring arms 7 are connected by oppositely outwardly directed U-bends 9 with the ends of a pair of arms 10. Said arms 10 are at the opposite outer sides of the pair of spring arms 8 and are preferably parallel with and spaced from the latter. Also said arms 10 are preferably spring arms or tempered so as to be resilient.

The arms 10 extend alongside the pair of spring arms 8 to points beyond the shoulders 7 where they turn inwardly toward each other and generally toward neck 6 as seen at 11 (Fig. 2). These inturned portions of arms 10 are integrally connected with the die member 12.

The die or female member 12 has an outline complementary to the outline of sides 5 of the punch member, having divergently extending sides 13 with which the sides 5 of the punch member cooperate for shearing out slots 14 or 15 in card 16 (Fig. 4).

The die member 12 extends outwardly of the closed end 17 of the cutting portion, as indicated at 18, and which projecting portion may be formed with an opening 19 for screw 20 (Fig. 1) for securing the die member in the punch device.

The arms 8 extend slantingly from the return bends 9 relative to arms 10 so as to support the punch member at one side of the die member (Fig. 3). This enables a card to be slipped between the punch member and the die member. Upon forcing the punch member into the die member against the resistance of the spring arms the card will be slotted out to the edge as seen in Fig. 4.

The end of the punch member at the convergent ends of sides 5 is formed with a projection 21 that extends toward the die member. This projection is adapted to extend into any one of the holes 22 in card 16 to insure proper slotting out of such hole. It functions as a guide and positioner.

The side 23 of the punch member that faces the die member is also slanted from projection 21 in direction toward the neck 6 so that the widest end of the punch member will be at the neck end of the latter. Thus when the punch member enters the die member, the card will be progressively cut from the edge thereof to the hole. This progressive thickening of the punch member in direction away from the projection 21 facilitates the cutting operation.

By the structure described, with particular ref-

erence to the arrangement of the arms 8, 10 the pending operation may be performed for many months and even years without breakage. The arms 8, 10 and the return bends all contribute toward distributing the spring tension and reducing the tendency to concentrate the bending at localized points where ultimate breakage is most likely to occur. Also the arrangement of the arms and return bend tends to make the device more flexible than heretofore.

It is to be understood that the detailed description and drawings are not to be considered restrictive of the invention but merely illustrative of a preferred form.

I claim:

1. A punch comprising a punch member and a die member complementary thereto, two pairs of spring arms supporting said punch member spaced from said die member for movement into the latter against the tension of said arms upon force being applied to said punch member in a direction toward said die member, one of said pairs of arms being connected at one of their ends to said punch member, the other pair of arms being connected at one of their ends to said die member, the opposite ends of said other pair being respectively connected to one of the opposite ends of the arms of said first mentioned pair, the pair of arms connected to said die member being disposed outwardly of the pair of arms connected to said punch member and said arms, punch member and die member being integrally united.

2. A punch comprising a punch member and a die member complementary thereto, a pair of spaced spring arms connected at one of their ends to said punch member supporting said punch member for movement into said die member against the tension of said spring arms upon force being applied to said punch member in a direction toward said die member, means integral with said die member projecting therefrom, the outer ends of said spring arms remote from said punch member being integrally connected to the outer end of said means, said means comprising a pair of spring arms parallel with the arms on said punch member and disposed at the opposite outermost sides of the pair of arms on said punch member.

3. A punch comprising a punch member and a die member complementary thereto, said punch member being formed with a neck projecting from one side thereof and a pair of spaced spring arms secured to the outer end of said neck extending in side by side relationship from said outer end, a pair of spaced arms secured at one of their ends to said die member and spaced from said spring arms and positioned at the opposite outer sides of said pair of spring arms so that said pair of spring arms will be positioned between said pair of arms, a U-bend connecting each of said spring arms with the arm on said die member that is positioned at its said outer side, said U-bends being at the ends of said arms that are remote from said neck and die member, the said pair of spring arms extending slantingly relative to said pair of arms from said U-bends whereby said punch member will be yieldably held by said spring arms to one side of said die member.

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