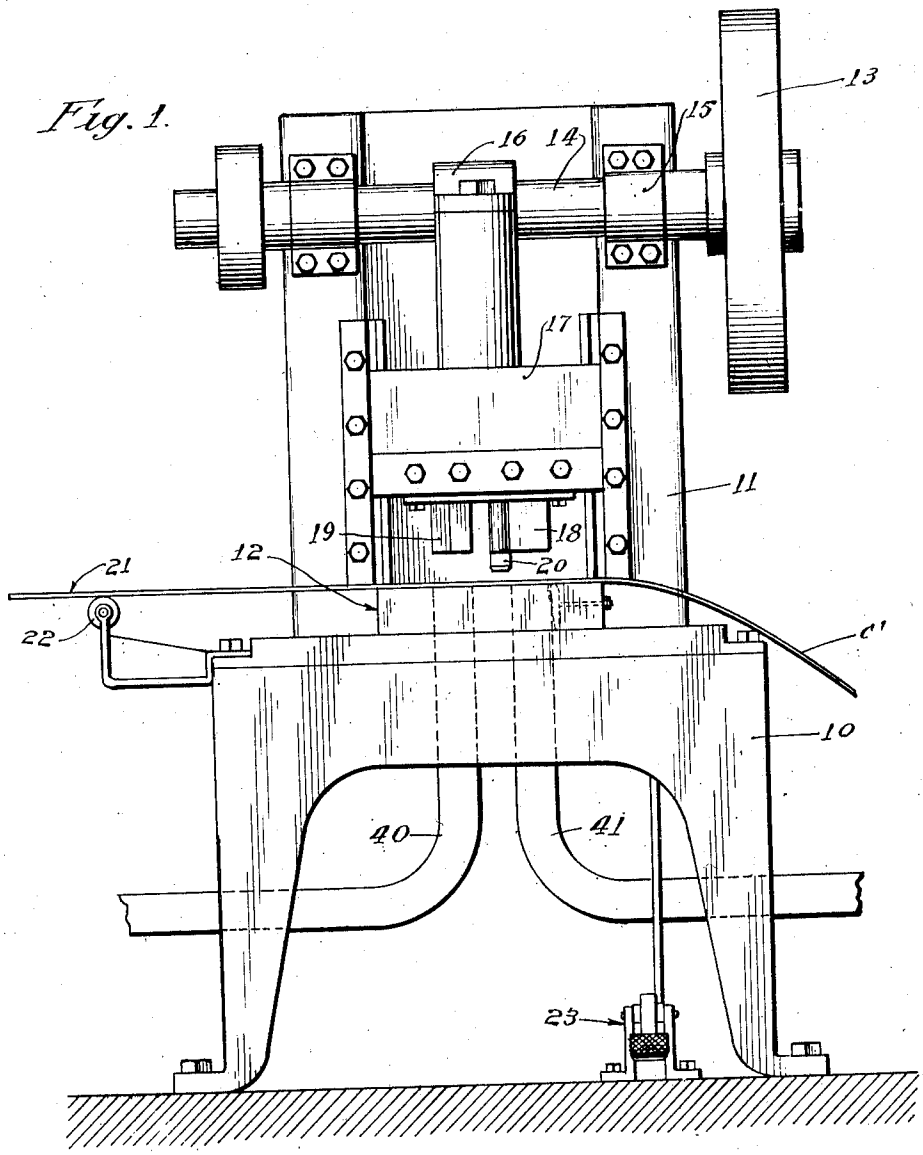
Sept. 24, 1929. H. PHILIP 1,729,123

PUNCH PRESS DIE

Filed March 14, 1927 2 Sheets-Sheet 1

Fig. 1.



Inventor.
Howard Philip.
By: Williams, Bradbury, McCaleb & Hinkle
Atty's

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Fig. 2.

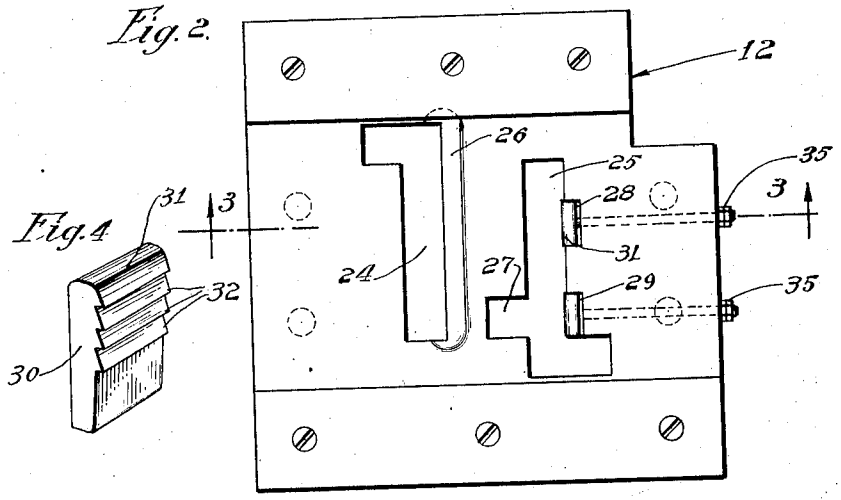


Fig. 3

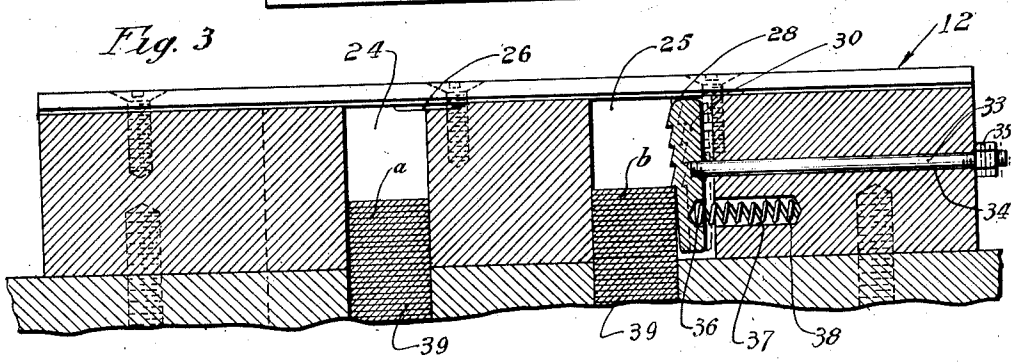
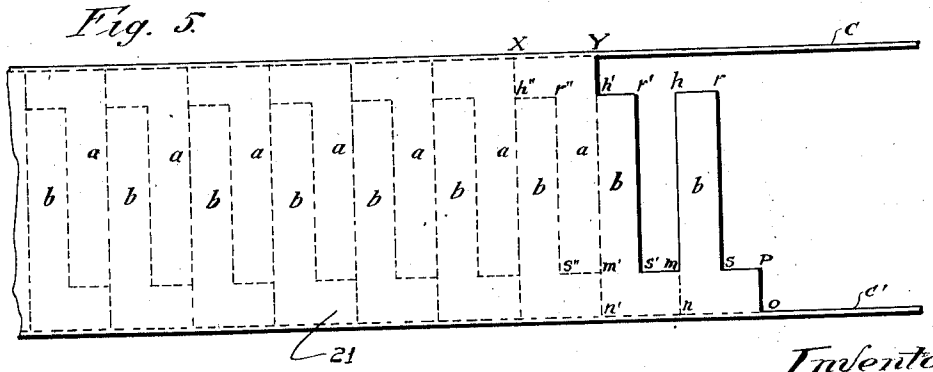


Fig. 5.



Inventor:
Howard Philip

By: Williams, Bradbury, McCaleb & Hinkle
Atty's.

Patented Sept. 24, 1929 1,729,123

UNITED STATES PATENT OFFICE

HOWARD PHILIP, OF NORTH CHICAGO, ILLINOIS, ASSIGNOR TO FANSTEEL PRODUCTS COMPANY, INC., OF NORTH CHICAGO, ILLINOIS, A CORPORATION OF NEW YORK

PUNCH-PRESS DIE

Application filed March 14, 1927. Serial No. 175,337.

My invention relates to an improved die for use in punch presses adapted to make thin metal stampings, and relates especially to a means for stacking the stampings whereby they may be easily handled.

Heretofore in stamping processes it has been desirable to stack the stampings in a suitable guide so that they may be removed in large numbers and packed without the necessity of sorting. No difficulty is experienced when the stamping is cut on substantially all sides.

However, when only a small edge of the stamping is cut by the die and a large portion of the edge fits loosely in the aperture of the die, it has been found that the stampings are not held in place by friction with the sides of the die, and the resiliency of the stack of stampings in this guide forces the thin stampings on top in an upward direction, so that they tend to follow the punch and to fall out on top of the die.

This difficulty has made it impossible to use a guide for collecting the stampings. Instead a large box has been placed under the press and the stampings have been allowed to fall in this box. This required some ten or fifteen sorters to arrange the blanks in order.

The object of my invention is to provide an improved die with means for preventing this upward movement of the stampings whereby a guide may be used for collecting the stampings.

Other objects will be apparent as the description of the invention proceeds.

In the accompanying drawings which represent a preferred embodiment of my invention and in which similar reference characters refer to like parts,

Fig. 1 represents a conventional punch press;

Fig. 2 is a plan of the improved die;

Fig. 3 is a section of the improved die taken on lines 3—3 of Fig. 2;

Fig. 4 is a detail view of the serrated dog; and

Fig. 5 is the plan of the thin metal sheet from which the stampings are made.

The conventional punch press shown in Fig. 1 may be briefly described as a suitable base 10 supporting a frame 11 and a die 12. Frame 11 carries a suitable pulley 13 which is mounted on a shaft 14 rotatable in suitable bearings 15. The pulley 13 may be driven by any suitable power means, not shown.

Secured to the shaft 14 is a cam 16 which operates a suitable press head 17 slidably mounted in the frame 11. On the underside of the press head are suitably mounted punches 18 and 19 and a pilot pin 20, the purpose and construction of which elements are well known and need no further description.

In the preferred embodiment the strip of metal 21 to be stamped is automatically fed over roller 22, the driving means and the strip feed being properly synchronized. A pedal 23 may operate a clutch for disengaging the driving mechanism or regulating the speed of the machine.

The die 12 is shown in detail in Figs. 2 and 3. This particular die is used for stamping out L-shaped pieces of thin coated iron to be used in forming laminated cores for alternating current transformers. The die may be described as a steel block having apertures 24 and 25. The strip is fed from left to right over this die, and to prevent the edge of the strip from hitting against the right hand side of aperture 24 a slight depression 26 is made, as shown in Fig. 2, allowing the strip to slide easily past the first opening.

The second aperture 25 includes a channel 27 adapted to receive the pilot pin 20 for the purpose of aligning the work. Aperture 25 also includes channels 28 and 29 in which are slidably mounted serrated dogs 30.

These serrated dogs may be described as a small block provided with a cam face 31 and a series of teeth 32, the purpose of which will be hereinafter described. Each dog is secured to a rod 33 which is slidably mounted in aperture 34 and which is threaded to receive a nut 35 at its outer end, as shown in Figs. 2 and 3.

The dog and the die are also provided with aligned openings 36 and 37 in which there is a compressed spring 38 which tends to force the dog 30 toward the aperture. The die is

provided with suitable screws and fastening means which are well known in the art and need no description here.

Fig. 5 represents a thin strip of iron from which the stampings are made. It will be noted that the entire blank is utilized with the exception of a small margin *c* and *c'*. When the strip is fed through the press, punch 19 cuts out stampings *a*, and punch 18 cuts off stampings *b*. There is always one stamping *b* between punch 18 and punch 19. For instance, while punch 18 is cutting stamping opsrhn, punch 19 will be cutting strip *m'xyh''r''s''*. Immediately preceding the punching operation the pilot pin 20 will engage sides *mh* and *s'r'* to align the strip properly.

The operation of my invention may be described as follows:

In each operation punch 19 cuts strip *a* along all of the edges with the exception of a small portion *h'y*. Therefore, the strips *a* frictionally engage the sides of the aperture with sufficient force to prevent any upward movement of these stampings. There is a very strong upward thrust of these stampings due to the resiliency of the column of strips in guide 40, but the frictional engagement with the side walls is sufficient to overcome this upward force.

However, the stampings *b* in the second aperture 25 are only cut along edges *on* and *nm*. The edges *mhrspo* are pressed loosely in the die, but are not cut in this process. These edges do not bear against the sides with sufficient pressure to hold them in place, and the tendency is for the column of strips 39 in the guide 41 to follow the upward movement of punch 18 and fall out of or obstruct the die.

Heretofore, as above stated, it has been deemed impossible to use a guide for stacking and collecting stampings *b* and a large wooden box was placed under the aperture 25, in which the stampings were allowed to fall indiscriminately, and a large amount of time and labor was required to sort out and stack the stampings.

The operation of the serrated dog 30 makes it possible to use a guide for collecting these stampings. When the punch 18 descends its edge impinges on the cam surface 28 of the serrated dog, which causes it to slide back against the compressed spring 38 and allow the punch with the stamping to descend. On the upward movement, however, the serrations or teeth 32 positively engage the stampings and prevent the upward movement thereof. These teeth or serrations are preferably in a gradual step down relation, that is, each tooth is set in a slight amount further than the tooth above it. With the use of this improved device, no difficulty is experienced in stacking the stampings, even though a very small fraction of the perimeter of the blank is cut by the die.

While I have described a specific example of my invention, it is understood that I am not limited to the details shown and described, except as defined by the following claims.

I claim:

1. A stamping die provided with a cutting edge and a non-cutting edge surrounding an aperture and a channel in one side of the aperture, means in said channel for preventing upward movement of stampings, and means to hold said first mentioned means in operative position.

2. A stamping die provided with a cutting edge and a non-cutting edge surrounding an aperture and a channel in one side of the aperture, a serrated dog in said channel and means to urge said dog toward the aperture.

3. A die provided with a vertical aperture, a vertical channel communicating with said aperture and a horizontal bore communicating with said channel, a rod slidably mounted in said bore, a serrated dog slidably mounted in said channel and fixed to said rod, and resilient means urging said dog toward said aperture.

4. Means for stacking thin stampings where the frictional engagement with the sides of the die do not hold said stampings in place which comprises a slidably mounted serrated dog, the serrated portion extending normally in the path of a punch, a cam face on said dog whereby the descending punch forces back the dog, and resilient means urging the dog forward into operative position.

5. In a punch press, a punch, a stamping die provided with an aperture therethrough, a guide for stampings associated with said die and communicating with the aperture therein whereby stampings may be forced through the die by the punch and stacked in the guide, and means associated with the die for compensating for any lack of friction between the stampings and the die, thereby preventing the upward force of the stack of stampings from pushing the top stampings out of the aperture in the die and extending within the die aperture.

6. In combination a stamping die provided with an aperture having a cutting edge and a non-cutting edge, and a retaining dog in said aperture at said non-cutting edge, said dog comprising a block provided with a receding series of ratchet teeth and with a cam surface above the top tooth.

In witness whereof, I hereunto subscribe my name this 8 day of March, 1927.

HOWARD PHILIP.