

1,044,861.

J. R. COX.
PUNCH PRESS.
APPLICATION FILED SEPT. 5, 1911.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

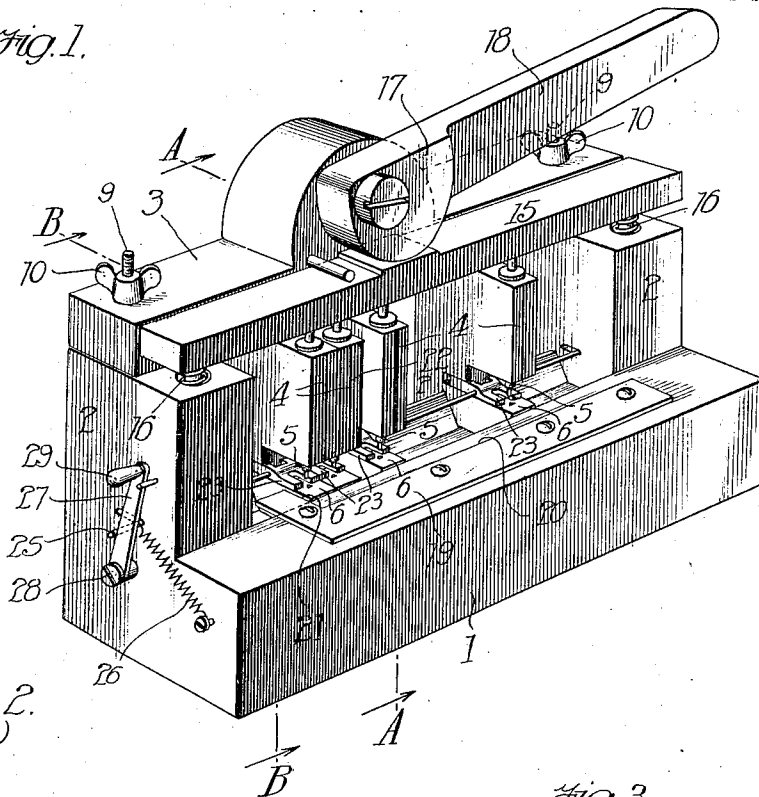


Fig. 2.
(AA)

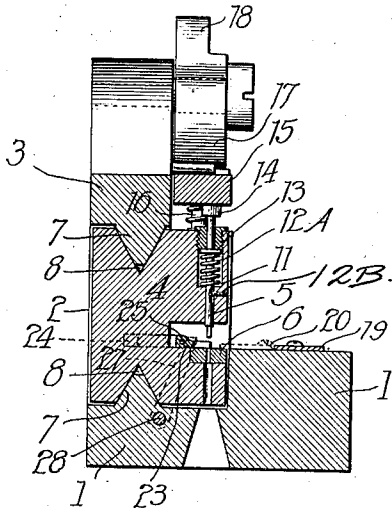
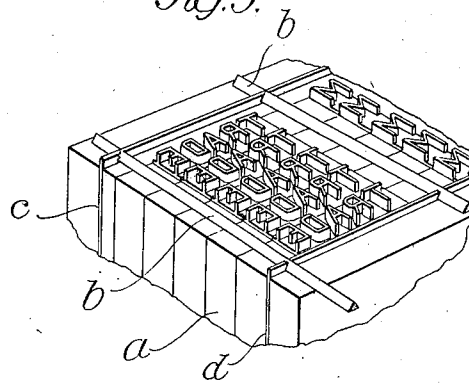


Fig. 3.



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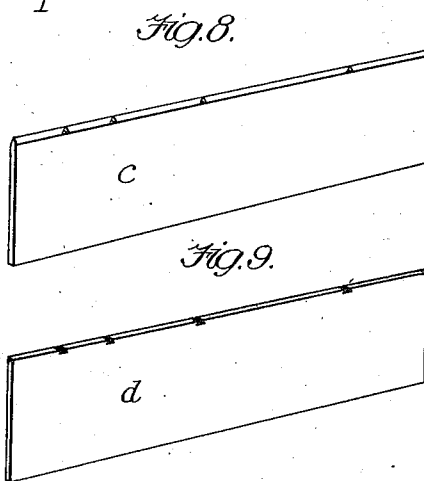
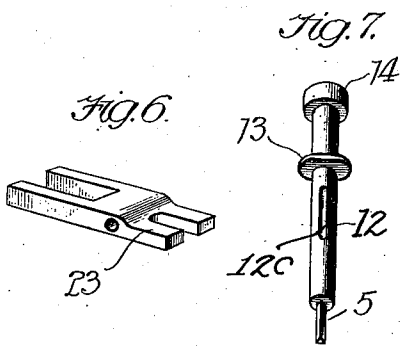
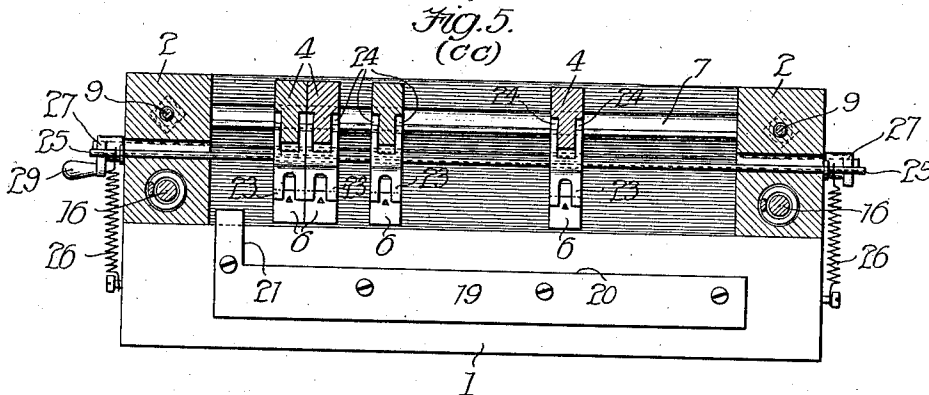
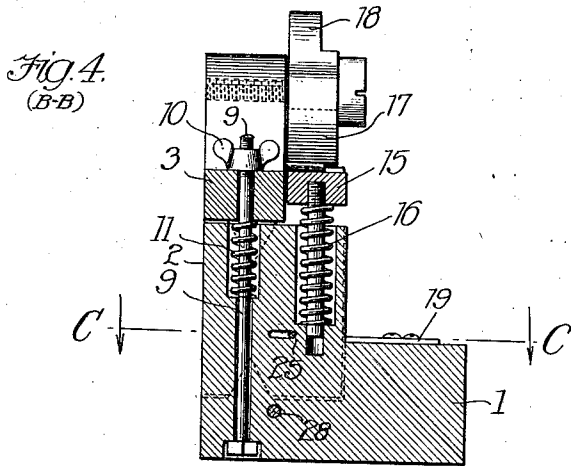
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PUNCH-PRESS.

1,044,861.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed September 5, 1911. Serial No. 647,665.

To all whom it may concern:

Be it known that I, JAMES R. COX, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Punch-Presses, of which the following is a specification.

This invention relates to punch presses, and the specific embodiment thereof which will be hereinafter described is, particularly designed for cutting notches in the edges of the anchor plates which are used for supporting the rules for printing tabular column lines in connection with linotype forms. The structure and method of securing these rules will be hereinafter briefly described, but will not be claimed, as they are made the subject matter of my copending application, Serial No. 640,252, filed July 24th, 1911. As these rules usually consist of extremely thin prismatic metal bars, it is of the utmost importance that the recesses in the anchor plates in which the rules are secured be exactly alined, and as the spacing of the rules must be capable of variation to suit the requirements of any particular job, it has been found necessary to devise a special form of punch press for cutting the recesses having special means whereby the spacing of punches may be readily adjusted and whereby the setting of the punches may be gaged direct from the linotype slugs in connection with which the rules are to be used.

The main objects of this invention are to provide an improved form of multiple punch press wherein the punches may be readily adjusted with respect to each other, and wherein accurate alinement of the punches and their respective dies will be positively insured; to provide a punch press of this class which is particularly suitable for cutting recesses in cross rules and anchor plates to be used for supporting column rules in a printing form made up of linotype slugs; to provide an improved arrangement of parts of the press whereby the setting of the punches may be gaged direct from the linotype slugs; and to provide improved means for clamping the anchor plates in position on the bed of the punch press so as to insure accurate registration of the column rule recesses of successive anchor plates, regardless of whether such anchor plates are of a

width suitable to enable them to serve as cross rules, or are of reduced width, so as to be below the printing surface and to serve merely as securing means for anchoring the column rules.

An illustrative embodiment of this invention is shown in the accompanying drawings, 60 in which—

Figure 1 is a perspective view of a punch press constructed according to this invention for use in connection with the assembling of linotype printing forms for tabular work. 65 Fig. 2 is a sectional detail taken on the plane of the irregular line A—A of Fig. 1. Fig. 3 is a fragmentary perspective view showing the kind of printing form which has been made commercially practical by the use of 70 the device shown in Fig. 1. Fig. 4 is a section taken on the line B—B of Fig. 1. Fig. 5 is a section taken on the line C—C of Fig. 1. Fig. 6 is a detail in perspective of one of the clamp jaws which hold the anchor plates 75 in position upon the bed of the press while the column line recesses are being cut. Fig. 7 is a detail in perspective of the punch. Figs. 8 and 9 are details respectively of the wide and narrow anchor plates. 80

The printing form represented in Fig. 3 is made up of the usual cast slugs *a* representing a line of type, column rules *b* consisting of fine triangular bars which rest on the upper faces of the slugs so as to provide 85 an upstanding printing edge, and anchor plates *c* and *d* which are of two widths. The plate *c* is of a width equal to the type height so that its upper beveled edge will lie in the same plane with the printing edge of 90 the column rules *b* and will thus serve as a cross rule, and the plate *d* is of narrower width so that its upper edge will be below the printing surface. In making up the form, the column rules *b* are inserted 95 through dovetail recesses in the upper edges of the anchor plates. The hereinafter described machine is especially designed for cutting these recesses.

In the construction of the machine shown 100 in the drawings, the main frame comprises a bed plate 1, uprights 2, and a cross bar 3 connecting the upper ends of the uprights 2.

There is a series of punch units 4 mounted between the bed 1 and the cross bar 3 and 105 each of the units 4 comprises a sub-frame or

block having therein a punch 5 and die 6 so mounted in the sub-frame as to insure their proper axial alinement at all times regardless of the position of the respective unit along the bed. Each of the punch units is slidably mounted to fit between the cross bar 3 and the bed 1. This is preferably accomplished by means of wedge-shaped guide ribs 7 and grooves 8, so that when the cross bar 3 is fastened in operative position on the uprights 2, all of the sub-frames 4 will be clamped against lateral displacement. In the form shown, the cross bar 3 is connected with the uprights 2 by means of bolts 9 threaded at their upper ends and carrying wing nuts 10. The apertures for the bolts 9 are counterbored at the upper ends of the uprights 2 so as to provide seats for springs 11 (Fig. 4) which, when released, lift the cross bar 3 clear of the sub-frames of the punches and allow the punches to be adjusted freely relatively to each other.

Each punch 5 is carried by an enlarged plunger or shank 12, which is slidably mounted in the sub-frame and is normally urged to a raised position by means of a spring 12^a (Fig. 2), seated in a counterbore in the sub-frame, and bearing against a collar 13 on the shank 12. In the form shown, turning of the punch 5 is prevented by a pin 12^b engaging a slot 12^c in the shank. The shank 12 is provided with a head 14 at its upper end, which engages a cross head 15, by means of which all of the punches are operated in unison. The cross head 15 is guided in the uprights 2 to have vertical movement, being normally urged to its lifted position by means of springs 16 and being forced downward during the punching operation by means of a cam 17 having a hand lever 18, said cam being pivoted on the cross bar 3.

In order that the recesses in the anchor plates will be in exact alinement so as to insure that the column rules will be straight when the form is assembled, the bed 1 of the press is provided with an L-shaped guide 19 having a gage shoulder 20 disposed in parallel relation with the line of punches and a second gage shoulder 21 at right angles to the shoulder 20, and extending between the shoulder 20 and the row of punches. The shoulder 20 is spaced from the dies a distance which is exactly equal to the height of the type bars, exclusive of the raised letters thereon. The shoulder 21 is the zero line with respect to which the punches are adjusted. The column rules *b* are of a height equal to the height of the printing surface above the upper surface of the type slugs, and the punches are of the same sectional area as the column rules so that the recesses which are cut thereby will be a close fit for the rules and rigidly hold them against distortion or displacement. Each of the punch

sub-frames 4 is provided on its front face with a ruling or indicator line 22, which is vertical, and lies in a plane extending through the axis of the punch and at right angles to the base gage shoulder 20. These indicator lines enable the operator to adjust the position of the punches by standing one of the slugs in an upright position in front of the row of punches with its end abutting against the gage shoulder 21, and then setting the punch sub-frames so that their respective indicator lines 22 will correspond to the positions in which it is desired to have the column rules in the form.

In order to insure that the anchor plates will be uniformly punched, clamp jaws 23, one for each punch, are mounted on the punch sub-frames in position to engage the anchor plate and force it against the gage shoulder 20. These jaws 23 are forked at their front ends so as to allow the punches to pass through them, and their rear ends are seated in guide grooves 24 in the sub-frame blocks 4. This arrangement of the jaws 23 renders them adjustable with the punches and therefore avoids their interfering with the adjustment of the punches. A rod 25 extends through each of the clamp jaws 23 and through slots in the uprights 2 and is normally urged to the forward limit of its movement by springs 26. This rod controls the position of the clamp jaws, as will appear from Figs. 1 and 2. The jaws 23 may be shifted at will to their retracted position by means of a pair of arms 27 carried by the shaft 28, extending through the frame from end to end, one of said arms 27 being provided with a handle 29.

The operation of the device shown is as follows:—After the slugs *a* have been cast, preparatory to making up the form, one of the slugs is placed upright on the base 1 of the punch press in front of the row of punches and is pushed toward the left of Fig. 1 until its edge abuts firmly against the gage shoulder 21. The wing nuts 10 are then released so as to release the cross bar 3 from clamping engagement with the sub-frames 4 of the punches, and the punches are then shifted so that their indicator lines 22 will occupy positions with respect to the slug corresponding to the desired location of column rulings in the form. Then the nuts 10 are screwed down, causing the punch frames to be securely clamped through the wedging action of the ribs 7, insuring that each punch takes a position exactly in a vertical plane at right angles to the bed plate and gage shoulder 20. The slug is now removed from the base and may be replaced in the form. The machine is now ready for cutting the recesses in the anchor plates *c, d*. One of these at a time is placed in position so as to lie flat upon the bed 1 with its bottom edge bearing against the gage shoulder 20

and its lefthand edge bearing against the gage shoulder 21, the clamp jaws 23 being in the meantime held in a retracted position by pushing back on the handle 29. As soon as the anchor plate is in proper position, the handle 29 is released and the springs 26 cause the clamp jaws 23 to force the anchor plate firmly against the gage shoulder 20. The recesses are then punched by pushing down on the handle 18 and thereby simultaneously operating all of the punches. In this way, each of the anchor plates is punched and it is immaterial whether the anchor plate is of the wide or narrow form, since in either case, the position of the perforations is gaged from the bottom edge of the anchor plate. In the anchor plates *c* which serve as cross-rules, the apex of the triangular hole will lie exactly in the upper edge of the plate, whereas, in the anchor plates *d*, which do not print, and which serve merely for securing the column rules, the apex will lie outside of the edge of the plate and the front part only of the punch will penetrate the plate.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted, without departing from the spirit of this invention, as defined by the following claims.

I claim:—

1. In a punch press of the class described, comprising a frame, a punch and die unit, a guide member having a pair of gage shoulders at right angles to each other, means carried by said punch and die unit, and coacting with said gage shoulders for gripping a plate and holding it in position to be operated upon by said punch, said punch and die unit and guide members being relatively adjustable to permit said punch to operate upon said plate at various points along its edge.

2. A device of the class described, comprising a bed, a plurality of punch units relatively movable along said bed and each comprising a punch disposed at right angles to said bed, a gage shoulder extending along said bed and equally spaced from said punches, and means coacting with said gage shoulder for gripping a plate and holding it in position to be operated upon by said punches.

3. A device of the class described, comprising a bed, a plurality of punch units relatively movable along said bed and each comprising a punch disposed at right angles to said bed, a gage shoulder extending along said bed and equally spaced from said punches, and means carried by said punch units and coacting with said gage shoulder for gripping a plate and holding it in position to be operated upon by said punches.

4. A device of the class described, comprising a bed, a plurality of punch units relatively movable along said bed and each comprising a punch disposed at right angles to said bed, a gage shoulder extending along said bed and equally spaced from said punches, and means adjustable with said punch units and coacting with said gage shoulder for gripping a plate and holding it in position to be operated upon by said punches.

5. A device of the class described, comprising a bed, a plurality of punch units relatively movable along said bed and each comprising a punch disposed at right angles to said bed, a gage shoulder extending along said bed and equally spaced from said punches, means coacting with said gage shoulder for gripping a plate and holding it in position to be operated upon by said punches, means normally urging said gripping means into the engaged position, and means for manually retracting said gripping means from the engaged position.

6. A punch press of the class described, comprising a bed, a punch unit comprising a punch disposed at right angles to said bed, said unit being adjustable along said bed, a gage shoulder extending along said bed in parallel relation to the path of said punch unit, and a second gage shoulder extending at right angles to the first between it and the path of said punch unit, and means for operating said punch unit in any of its positions of adjustment.

7. A punch press of the class described, comprising a bed, a punch unit comprising a punch disposed at right angles to said bed, said unit being adjustable along said bed, a gage shoulder extending along said bed in parallel relation to the path of said punch unit, a second gage shoulder extending at right angles to the first between it and the path of said punch unit, means for operating said punch unit in any of its positions of adjustment, and means carried by said punch unit and providing an indicator spaced away from the punch in fixed relation therewith in a plane parallel to said gage shoulder and adapted to indicate the distance of said punch from said second gage shoulder.

8. In a punch press, the combination of a frame comprising a pair of relatively movable parallel clamp members, a series of punch units mounted between said members and adjustable along them, said clamp members and punch units having interfitted wedge surfaces adapted to lock said punch units against shifting when said clamp members are in clamping engagement.

9. In a punch press, the combination of a frame comprising a pair of relatively movable parallel clamp members, a series of punch units mounted between said members and adjustable along them, said clamp mem-

bers and punch units having interfitting wedge surfaces adapted to lock said punch units against shifting when said clamp members are in clamping engagement, means normally urging said clamping members apart to release said units, and means for forcing said members into clamping engagement.

Signed at Chicago this 2nd day of September 1911.

JAMES R. COX.

Witnesses:

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EDWIN PHELPS.